

Prevention of Problem Gambling:  
A Comprehensive Review of the Evidence

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## **PREVENTION OF PROBLEM GAMBLING: A COMPREHENSIVE REVIEW OF THE ISSUES AND THE EVIDENCE**

Problem gambling prevention consists of a range of initiatives, each intended to reduce potential harm caused by legalized gambling. The traditional way of categorizing prevention efforts is by the type of people the efforts are directed toward. *Primary Prevention* is an effort to prevent individuals in the general populace from becoming problem gamblers. *Secondary Prevention* is an effort to prevent the development of problem gambling in individuals with risk factors for the condition. *Tertiary Prevention* is an effort to stop and potentially reverse the problems occurring in existing problem gamblers. However, another approach, and the one used in the present paper, is according to the nature of the initiative. Virtually all prevention initiatives can be categorized into two groups. *Educational Initiatives* are intended to change internal knowledge, attitudes, beliefs, and skills so as to deter an individual from problem gambling. *Policy Initiatives* are intended to prevent problem gambling through the alteration of external environmental controls on the availability and provision of gambling. The purpose of this paper is to comprehensively review what is known about the nature and effectiveness of educational and policy initiatives to prevent problem gambling.

In order to understand how to prevent something, it is first desirable to understand what causes it. Accordingly, discussion begins with an etiological perspective of problem gambling development.

### ETIOLOGY OF PROBLEM GAMBLING

The etiology of addictive behaviour, including problem gambling, is best understood from a biopsychosocial perspective. Essentially this perspective proposes a range of biological, psychological, experiential, and social factors that contribute to or protect from the development of the addiction. There is a general sequence of events:

1. Genetic inheritance first creates a brain and nervous system that increases or decreases an individual's susceptibility to engagement in addictive behaviour and/or the addiction itself (e.g., impulsivity, risk-seeking, vulnerability to stress, mood disorders, intellectual skills, central nervous system that is unusually responsive to the addicting substance/product).
2. Environmental experience then further increases or decreases risk of initiation and ongoing use of the addicting product or behaviour (e.g., abusive upbringing, parental modelling, peer group involvement, poor schools and teachers, early learning experience (e.g., early big win), poor social support, severe and frequent stressors, addicting product/substance being readily available, addicting product/substance being culturally acceptable).
3. Once the potentially addictive behaviour is engaged in, operant and classical conditioning increase the frequency and strength of the behaviour and the physiological processes underlying it, making it progressively more difficult to wilfully resist. The most 'addicting' or dependency-prone forms of gambling will tend to be the ones that offer the greatest frequency of reinforcement (typically electronic gambling machines).<sup>1</sup> At a psychological

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<sup>1</sup> This is very similar to substance abuse, where drugs with the highest frequency of administration have the highest rates of addiction (i.e., nicotine, despite being much less intrinsically addicting than other substances).

level, erroneous gambling cognitions as well as the psychological need that gambling serves further perpetuates this behaviour.

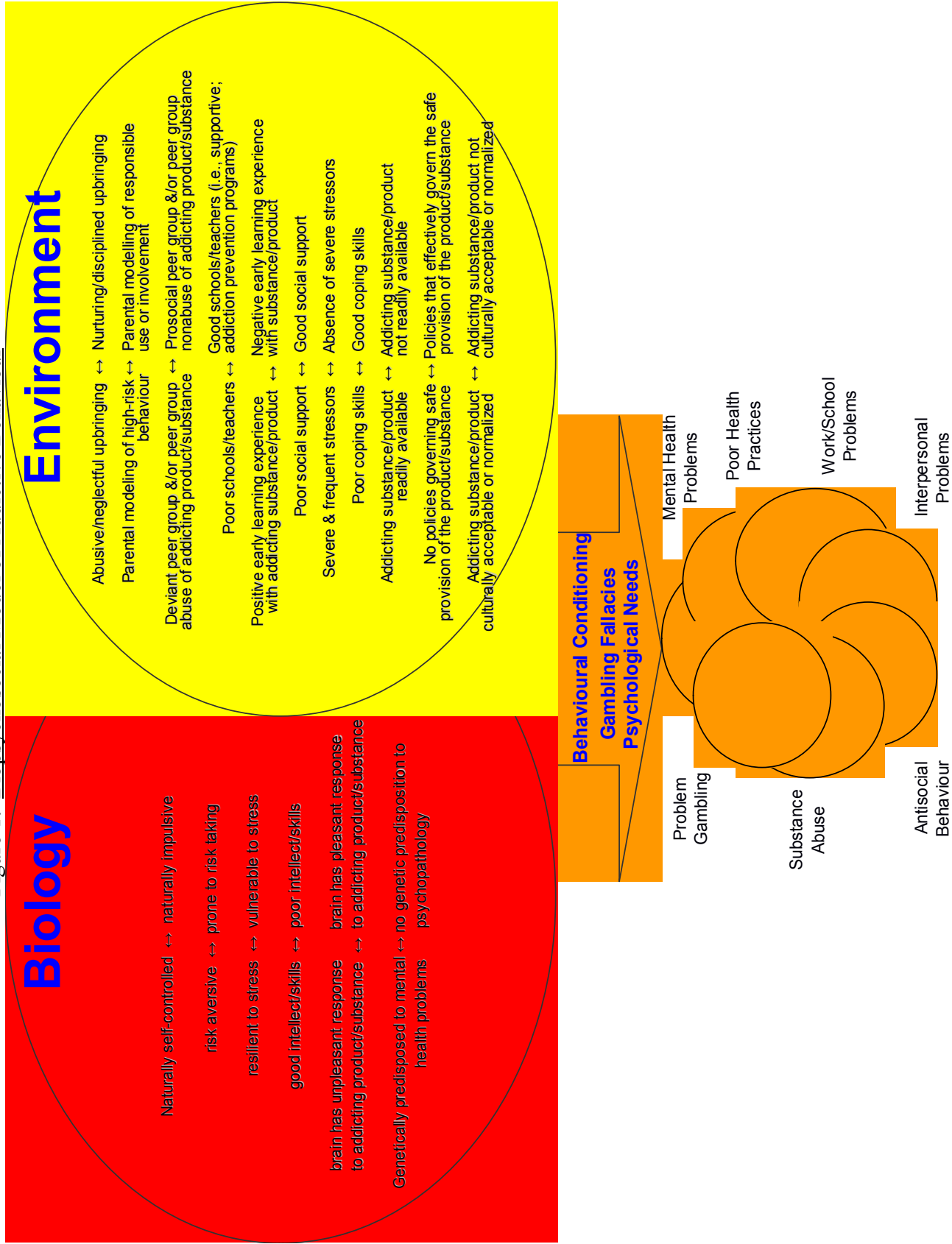
4. In many people, the above mentioned biological and environmental risk factors lead to a constellation of associated negative consequences to health and well-being (i.e., mental health problems, substance abuse, interpersonal problems, poor health practices, school/work problems, antisocial behaviour). These co-occurring problems tend to reinforce each other's existence, further hampering recovery from the addiction.

Figure 1 illustrates this model. The particular pattern of risk factors that leads to problem gambling is often different for different people, as is the age at which problem gambling develops. Having said this, the pattern of risk factors within an individual is not totally random. Rather, evidence points to at least two main subtypes or routes to addiction: the impulsive/antisocial pattern (often in males) versus the emotionally vulnerable pattern (often in females) (e.g., Blaszczynski & Nower, 2002; Windle & Scheidt, 2004).

The biopsychosocial model of problem gambling has three important implications for prevention:

1. Because of the large number of risk factors as well as the biological basis of some of them, the risk of problem gambling in a population may be reduced but will never be eliminated.
2. Because many risk factors also apply to other addictions and psychopathology, generic prevention initiatives targeting a wide range of problems (especially in youth) are likely both an efficient and essential component of problem gambling prevention.
3. Because a multitude of both internal and external factors contribute to problem gambling, effective prevention will almost certainly require a sustained, multifaceted, and coordinated approach provided to a wide range of age groups.

Figure 1: Biopsychosocial Model of Addictive Behaviour



## EDUCATIONAL INITIATIVES TO PREVENT PROBLEM GAMBLING

Preventive education targets individual learning within familial, societal, educational, and other environments. Initiatives include ‘upstream’ interventions, broad-based information/awareness campaigns, and more sustained and directed education such as statistical instruction and comprehensive in-school programs.

### ‘Upstream’ Interventions

It is well established that negative early childhood experience significantly influences the development of problematic behaviour later in life. Accordingly, it is not surprising that interventions to strengthen families and create effective parenting practices are generally one of the most powerful ways to reduce adolescent problem behaviours, and further serves to reduce problems at later ages (Foxcroft, Ireland, Lowe, & Breen, 2005; Kumpfer & Alvarado, 2003; Petrie, Bunn & Byrne, 2007). This is probably also true for the prevention of adolescent and adult problem gambling, although the approach has yet to be empirically tested. Nevertheless, there is good evidence that family-based programs are effective for the primary prevention of other addictive behaviour such as alcohol and drug use in young people (Foxcroft et al., 2005; Gates, McCambridge, Smith, & Foxcroft, 2005). It would be useful if future family/parenting interventions also included the incidence of gambling and problem gambling among the outcome measures.

For similar reasons, it is to be expected that exposure to well socialized peer groups, supportive teachers, and good schools would have the same beneficial effect on prevention of problem gambling as it does on the prevention of other problematic behaviour (Durlak, 1997; Durlak & Wells, 1997; Nation et al., 1993; Toumbourou, Williams, Waters, & Patton, 2005; Weissberg & Gullotta, 1997).

### Information/Awareness Campaigns

When most people think of problem gambling prevention they think of information campaigns targeted specifically at gambling. These are known variously as ‘information/awareness campaigns’, ‘mass media campaigns’ or ‘social marketing’. Campaigns are directed at the general public and usually contain information consisting of one or more of the following elements (e.g., AADAC, 2001; Jackson, Thomas, Thomason, & Ho, 2002; Murray, 2003):

- Encouragement to ‘know your limits’ or ‘gamble responsibly’.<sup>2</sup>
- Warnings about the potential addictive nature of gambling.
- Identification of the signs/symptoms of problem gambling.
- Information about where people can go for help or more information on problem gambling (i.e., treatment agencies; 24 hour telephone help-lines) (‘tertiary prevention’)

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<sup>2</sup> There has been an increasing usage of phrases such as ‘responsible *gaming*’, as opposed to ‘responsible gambling’. (Indeed, a Google search shows the former to now be the more commonly used expression). This is potentially problematic. When you portray your product as more benign than it actually is, you may defeat the purpose of alerting people to their over-involvement in it. It is somewhat analogous to taking ‘smoking kills’ messages off cigarette packages and replacing it with ‘please monitor your consumption of this enjoyable aromatic plant material’.

- Provision of the true mathematical odds of various gambling activities.
- Efforts to dispel common gambling fallacies and erroneous cognitions.
- Provision of guidelines and suggestions for problem-free gambling.

These initiatives are usually developed and delivered by governmental health or social service agencies, schools, or commercial gambling providers. The information itself is provided:

- On the gambling product (e.g., odds printed on the back of lottery tickets, ‘responsible gambling messages’ on electronic gambling machines (EGMs)).
- On posters and pamphlets at gambling venues and elsewhere throughout the community.
- In the form of ‘public service announcements’ on radio, television, and newspapers.
- By means of presentations, plays (Bell, 2004), or videos (most often presented in educational settings).
- On government, social agency and/or gambling provider websites. Examples of some teen-oriented websites are: <http://www.zoot2.com>, <http://www.luckyday.ca>, <http://inyaface.co.nz>, <http://www.wannabet.org>, <http://www.thegamble.org>, [www.responsiblegambling.qld.gov.au](http://www.responsiblegambling.qld.gov.au), <http://www.youthbet.net>.

Information/awareness campaigns are relatively inexpensive ways of delivering preventive health messages to a large portion of the population, and are intended to counter the often considerable commercial efforts to promote the product. The mass media is a particularly good way of reaching young people, as they are estimated to spend almost twice as many hours watching TV (22,000 hrs) as they spend in formal education (12,000 hrs) (Worden et al., 1988). Reaching young people is particularly important, as they may be more susceptible to commercial advertising promoting the product (a significant consideration in the case of gambling) (Atkin, 1995; Strasburger, 1995).

Although awareness campaigns to prevent problem gambling are relatively common across many jurisdictions, there is limited research on their impact (Auckland University of Technology, 2005). The evidence that does exist suggests that improvements in knowledge and awareness are reliably produced in people who are asked to attend to these messages. For example, a brochure on pathological gambling was found to effectively convey useful new information to members of the general public in Quebec who were shown it (Ladouceur, Vezina, Jacques, & Ferland, 2000). Similarly, videos on gambling have resulted in improved knowledge of gambling and problem gambling among Grade 11 and 12 students in Quebec (Ladouceur, Ferland, Vitaro, & Pelletier, 2005) as well as elementary school children (Ferland, Ladouceur, & Vitaro, 2002; Lavoie & Ladouceur, 2004).

Awareness campaigns appear to have a very limited impact *if people are not explicitly asked to attend* to the information or have no intrinsic interest in it. For example, Indiana implemented a statewide awareness campaign to promote responsible gambling using radio announcements, billboards, brochures, newspaper advertisements, posters, pens, and t-shirts, press conferences, and ‘problem gambling town hall meetings’. Najavits, Grymala, and George (2003) found that only 8% of the general public recalled seeing or hearing any advertising. However, of that 8%, 72% reported that the advertising had increased their knowledge of problem gambling. (One percent of the total sample took action based on seeing/hearing the ad such as calling the help line). A similar result was obtained in Ontario, Canada. Turner, Wiebe, Falkowski-Ham, Kelly, and Skinner (2005) found that 66% of the Ontario public was unaware of



any initiatives to reduce problem gambling. This is notable considering that Ontario is cited as spending proportionally more on problem gambling prevention, treatment, and research than any other jurisdiction in the world (Sadinsky, 2005). However, people who participated in slots and instant lotteries were significantly more likely to be report being aware of initiatives to reduce problem gambling, suggesting that gamblers may be noticing the presence of the help line number on tickets and slot machines. A more recent initiative in Ontario found that a media campaign to dispel myths about how slot machines worked was successful in significantly reducing these fallacies among a random sample of 900 Ontario gamblers in February 2005 before the campaign started, compared to a random sample of 900 gamblers in April 2007 after the campaign was completed (OLG, 2007).

In 1995 the Victoria Department of Human Services in Australia initiated a state-wide problem gambling awareness program consisting of a 5-week multi-language radio, newspaper and billboard advertisement phase in the first year, a 14-week television advertisement phase in 1996, and a 30-week radio and television advertisement phase in 1997 and 1998. Jackson, Thomas, Thomason and Ho (2002) evaluated the program, concluding that it produced an increased number of callers to the gambling helpline, and an increase in the number of new clients entering treatment. There was also more collaboration between help services and the staff at gambling venues, many of whom attended training/information sessions about problem gambling. In 2001, the Victoria government initiated a similar informational campaign which reportedly resulted in a 70% increase in calls to the helpline and a 118% increase in clients presenting themselves to treatment (Victoria Department of Human Services, 2002).

It is important to note that providing support to distressed gamblers or recruiting problem gamblers into treatment is a much less satisfactory 'prevention' outcome than results showing that awareness campaigns help inoculate the general public from developing gambling problems in the first place. There is no direct evidence on the effectiveness of awareness campaigns as a *primary* prevention tool for problem gambling, however, and the general public's lack of awareness of these initiatives is not very encouraging.

Fortunately, there is considerably more literature on the utility of public information/awareness campaigns for other health behaviours that contain lessons for the prevention of problem gambling (Byrne, Dickson, Derevensky, Gupta, & Lussier, 2005). In general, research has found that sustained information/awareness initiatives have significant potential to improve people's knowledge and/or change their attitudes at a community-wide level (Centre for Addiction and Mental Health [CAMH], 1999; Duperrex, Roberts, & Bunn, 2006; Grilli, Ramsay, & Minozzi, 2004; Sowden & Arblaster, 2005). Indeed, population surveys have long been known to show that mass media are in fact the leading source of information about important health issues, such as weight control, HIV/AIDS, drug abuse, asthma, family planning and mammography (Chapman & Lupton, 1994).

While knowledge and attitudinal changes have been fairly reliably obtained, *the ability of awareness campaigns to produce actual changes in behaviour is much less common* (CAMH, 1999; Duperrex et al., 2006; Grilli et al., 2004; Slater et al., 2005; Sowden & Arblaster, 2005; Stacy, Bentler, & Flay, 1994). Furthermore, the knowledge and attitudinal impact of prevention messages often decays with time, requiring that they be repeated regularly (Duperrex et al., 2006; Vidanapathirana, Abramson, Forbes, & Fairley, 2004).

The exceptions to this failure to achieve behaviour change are *situations where the information is personally relevant, behavioural change is comparatively easy to achieve, and/or the consequences of not changing behaviour are significant* (Janz, Champion, & Strecher, 2002). For example, after extensive media reports on dietary studies relating cholesterol-rich foods with heart disease, consumption of beef, eggs and fatty milk products in North America declined. Similarly, reports on the risks of excessive sodium consumption were associated with increased use of salt-free food products. A decline in the use of birth control pills and IUDs between 1970 and 1975 correlated closely with publicity about their possible adverse effects (Jones, Beniger, & Westoff, 1980). Vidanapathirana et al. (2004) found that mass-media interventions have immediate effects in promoting HIV testing. In the gambling context, evidence of behavioural change is seen the increase in help line calls or treatment-seeking as reported by Victoria Department of Human Services (2002) and Jackson et al. (2002) (and, anecdotally, by agencies in other jurisdictions when promoting these services).

#### More Sustained and Directed Educational Initiatives

As noted above, the advantage of awareness campaigns is their potential to reach large numbers of people. They have two main disadvantages. First, the exposure of any individual to the message is uncertain. Second, the duration of the message is quite short for people exposed to it. Thus, it is useful to examine the effectiveness of more sustained and directed educational efforts to prevent problem gambling.

#### Statistical Instruction

It is a fairly commonsensical idea that if gamblers truly understood the negative mathematical expectation of gambling, they would be inoculated from over-involvement. There are two general areas of research that support the contention that improved knowledge of gambling probabilities should positively impact gambling behaviour. The first is research demonstrating a positive impact of educating problem gamblers in treatment on the nature of randomness, and other errors of thinking underlying gambling fallacies (e.g., Ladouceur, Sylvain, & Boutin, 2000; Ladouceur, Sylvain, Letarte, Giroux, & Jacques, 1998; Sylvain, Ladouceur, & Boisvert, 1997). The second is research that shows statistically trained college students to be less susceptible to certain specific fallacies (Benassi & Knoth, 1993), and to have better general reasoning skills for everyday problems (Fong, Krantz, & Nisbett, 1993; Kosonen & Winne, 1995).

However, the literature specific to the impact of improved statistical knowledge on gambling behavior is mixed, at best. Lichtenstein, Slovic and Zink (1969) found that explaining the concept of 'expected value' (EV) and making it explicit in the gambling tasks presented resulted in only one-third of subjects moving to maximize EV, with one-quarter moving toward lower EVs. Schoemaker (1979) found that university students who received statistical training made superior choices in a gambling task compared to untrained students. However, Gibson, Sanbonmatsu and Posavac (1997) found that students explicitly asked to evaluate the probability of a certain sports team winning tended to overestimate the team's actual chances, and subsequently gambled more relative to students not asked to evaluate any specific team. Similarly, Hertwig, Barron, Weber, and Erev (2004) found that students educated about the

probabilities of certain events gambled on rare events more than they should, compared to students who were given direct experience with these probabilities but did not know the actual odds. Steenbergh, Whelan, Meyers, May, and Floyd (2004) found that university students who were given an explicit warning about erroneous gambling beliefs and the negative mathematical expectation of gambling gained superior knowledge about these things, but were just as likely to gamble on a roulette game compared to students not given these messages. In contrast, Floyd, Whelan, and Meyers (2006) found that viewing messages on irrational gambling beliefs caused university students to have less risky gambling behaviour in a computerized roulette game with imaginary money. Recently, Williams and Connolly (2006) gave 198 Introductory Statistics university students lessons on probability theory using examples from gambling as well as several laboratories providing hands-on experience with casino games. Six months after the intervention, students receiving the intervention demonstrated superior ability to calculate gambling odds as well as resistance to gambling fallacies. However, this improved knowledge and skill was not associated with any decreases or changes in actual gambling behaviour. Similarly, Lambos & Delfabbro (2007) and Delfabbro, Lahn & Grabosky (2006) found that pathological gamblers had significantly higher rates of cognitive biases, but did not differ from nonpathological gamblers in knowledge of gambling odds or numerical ability.

In many ways, it may be that teaching people about gambling odds is analogous to telling smokers about the harmful effects of smoking, or alcoholics about the harmful effects of drinking. Individuals involved in these behaviours are usually already aware of these facts. Knowing something and having this knowledge alter your behaviour are often two different things. While knowledge is, in most instances, a necessary antecedent to changing or preventing harmful behaviour, it is often not sufficient on its own (e.g., Stacy, Bentler, & Flay, 1994; Williams & Gloster, 1999). It would seem that prevention frameworks that rely heavily on providing gamblers with ‘informed choices’ may have limited preventative effects (Blaszczynski, Ladouceur, & Shaffer, 2004; Blaszczynski, Ladouceur, Nower, & Shaffer, 2005).<sup>3</sup>

### Comprehensive Programs

Elementary and high-school based prevention programs for problem gambling are relatively uncommon, but they do exist in some jurisdictions. Such programs typically have a broad scope of topics that include teaching statistical knowledge about gambling, providing information on the potentially addictive nature of gambling, explaining gambling fallacies, building esteem, and peer resistance training. Examples of these types of programs are “Don’t Bet On It” in South Australia for ages 6 to 9; “Gambling: Minimising Health Risks” in Queensland for grade 5; “Facing the Odds” in Louisiana for grades 5 to 8; “Kids Don’t Gamble... Wanna Bet” in Minnesota and Illinois for grades 3 to 8; “Youth Making Choices” for high school students in Ontario; “Count me Out” in Quebec for ages 8-17, “Hooked City” in Quebec for grades 7 – 12; and “Gambling: A Stacked Deck” in Alberta for grades 9-12.

There has been very little published evaluation of these programs. Gaboury and Ladouceur (1993) evaluated a 3-session program in Quebec that was based on an alcohol prevention model. The program covered an overview of gambling, discussion of legal issues, how

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<sup>3</sup> Alternatively, it is possible that researchers have been targeting the wrong types of knowledge and that efforts focused primarily on correcting gambling fallacies may be more productive than efforts focused primarily on improved understanding of probability.

the gambling industry manipulates the chances of winning, beliefs and myths about gambling, and the development of pathological gambling. A sample of 289 juniors and seniors from 5 high schools completed the program. Whereas the evaluation showed that the students did learn about gambling and coping skills, these effects did not significantly influence their gambling attitudes or behaviour six months later.

An unpublished study by Ferland, Ladouceur and Jacques (2000) also obtained mixed results. This program targeted 1207 youths in grades 8, 9 and 10 in Quebec, with half receiving three “interactive meetings” and the other half acting as the control school. The program provided information on knowledge of/misconceptions about gambling activities, social problem solving, and excessive gambling. Results at three months post-intervention indicated that the program produced a significant improvement in knowledge about gambling and decrease in gambling misconceptions. However, there was no improvement in social problem solving ability, a skill thought to be lacking in individuals at risk for problem gambling. The impact of the program on actual problem gambling behaviour is unknown, as this outcome was not assessed.

The International Centre for Youth Gambling Problems and High-Risk Behaviours in Montreal, Quebec undertook an evaluation of their interactive CDs for the prevention of problem gambling in youth (“Hooked City” for grade 7 – 12 students and “The Amazing Chateau” for grades 4 – 6). Several months after being exposed to these interactive CDs, students had significantly improved knowledge about gambling, more awareness of the signs of problem gambling, and fewer gambling fallacies. However, there was no significant change in gambling behaviour, although there was a trend in this direction (IGYGPHRB, 2004).

Encouraging results have been obtained from a high school curriculum in Alberta called “Gambling: A Stacked Deck”. This program was first piloted in a Calgary high school in 2001 (Davis, 2003) and later revamped in 2002 and again in 2003 based on their implementation in other high schools in southern Alberta (Williams, Connolly, Wood, & Currie, 2003; Williams, Connolly, Wood, Currie, & Davis, 2004). The nature and content of the curriculum was derived from existing programs and a careful study of what was known to be effective in other primary prevention programs (Durlak, 1997; Durlak & Wells, 1997; Lipsey & Wilson, 1993; Mullen, Simons-Morton, & Ramirez, 1997; Weissberg & Gullotta, 1997). The resulting program contained the following elements:

- Information concerning the nature of gambling and problem gambling.
- Exercises to make students less susceptible to gambling fallacies.
- Information on the true odds involved in most gambling activities.
- Teaching and rehearsal of decision making and social problem-solving skills.
- Teaching and rehearsal of adaptive coping skills.

The format of the program was as important as the content. Format elements included:

- An entertaining and engaging delivery.
- A strong emphasis on skill learning and application of knowledge.
- A program consisting of 5 consecutive sessions, each lasting one hour.
- A program that also targeted the social environment of the people receiving the intervention, accomplished by ensuring all students in the targeted grade at the school received the program, so as to influence the person’s primary peer group.

Over 1,600 students from 12 different schools received the program and another 400 students served as the control group. At 3-6 months following the end of the program, students in the intervention group had significantly more negative attitudes toward gambling, better knowledge about gambling, fewer gambling fallacies, and significant decreases in all measures of gambling behaviour relative to both baseline and the Control Group. There were no changes in decision-making skills, other high risk activity, or prevalence of problem gambling (Williams, Wood, & Currie, in preparation).<sup>4</sup>

While the results of this study are encouraging, the program's long-term effectiveness is unknown. It is also sobering to examine literature from other fields (e.g., health promotion, tobacco and drug use), where results indicate that even with comprehensive educational approaches, effects on the desired behaviour are often small (Merzel & D'Afflitti, 2003; Sowden & Stead, 2005; Thomas & Perera, 2006; Wandersman & Florin, 2003) or nonexistent (Gates, McCambridge, Smith, & Foxcroft, 2005; Secker-Walker, Gnich, Platt, & Lancaster, 2002).

### On-Site Information/Counselling Centres

'Responsible Gambling Information Centres' (RGICs) located within gambling venues are a fairly new initiative. The primary purpose of the RGIC is to provide, on patron request, information and education about the risks of gambling (e.g. odds of winning and losing; demonstrations/tutorials about slot machine workings/random number generation). A second purpose is to identify, support, and refer RGIC visitors who are experiencing problems with gambling. Immediate crisis intervention and counselling may be provided, but ongoing counselling services are not necessarily included in RGIC mandates. Third, information and support is provided to venue employees, to assist them with customer interactions. In all jurisdictions, operational funding for RGICs has been provided either directly or indirectly by governments.

Several countries have implemented RGIC policies at gambling venues. The Crown Casino (2006) in Melbourne, Victoria, Australia has operated the Crown Customer Support Centre since May 2002. The Center is located away from gambling areas but within the Crown Entertainment Complex, and staffed by Casino employees who provide 24 hour on-site help, support, and counselling services to casino patrons (B. Horman, personal communication, August 11, 2006). In Queensland, a trial program is currently operational at one gambling club whereby a counsellor is made available on-site once per week, with associated costs borne by the venue (Queensland Treasury Department, personal communication, May 8, 2006). The Kangwon Land casino in Korea also offers on-site counselling services (Back, 2006). In Canada, the first RGIC opened in 2003 at the McPhillips Street Casino, Winnipeg, Manitoba. Information centres currently operate in 12 casinos in Canada: British Columbia (2), Alberta (2), Saskatchewan (1), Manitoba (2), Ontario (2), Quebec (1), and Nova Scotia (2). A thirteenth centre is located at a racino in Prince Edward Island. Canadian RGICs are variously staffed by persons with knowledge of addictions and counselling backgrounds. Employers include: addiction

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<sup>4</sup> An argument can be made that reducing all gambling behaviour may be less important and effective than reductions in 'risky' gambling behaviour/practices. Much work has been done in the alcohol field to identify high risk practices so as to specifically target these. However, without more research it is difficult to know what exactly constitutes risky gambling behaviour in adolescents.

prevention/treatment agencies (AB, MB), the department of health (SK), crown corporations operating the gambling facility (QC, PE), non-profit organizations (ON), and for-profit organizations (NS).

Most RGICs began operations in 2005 and 2006, and are considered to be pilot projects. Effectiveness evaluations either have not yet taken place, or are in very early stages. There is some information on utilization rates, which appear to be fairly low by patron utilization standards, although high by treatment provider standards. Approximately 4,600 people accessed the two RGICs in Ontario in a 1.5 year period beginning in November 2005 (OLG, 2007). However, to put this in context, approximately 118,000 people visit OLG venues *every day* (OLG, 2007). Approximately 8,000 customers are reported to have accessed Manitoba's RGICs between 2003 - 2006, 75% for information only, 10% for support and referral, and 15% for other reasons (Mehmel, 2006). Approximately 10,000 people visit Manitoba casinos every day. It is also interesting to note that the actual number of problem gamblers who have received treatment from the Addictions Foundation of Manitoba has gone down during this time period (523 in 2003/4 to 467 in 2004/5) (AFM, 2004, 2005). Similar relatively low rates of RGIC patron utilization are reported at one of Alberta's largest casinos, the Palace Casino, which has averaged 3 – 5 people per day in the initial 6 months (Canadian Broadcasting Corporation, 2006).

There are two other issues concerning RGICs. First, the extent to which they simply provide information is the extent to which their utility is similar to the information/awareness campaigns discussed earlier (i.e., potential to improve knowledge but weaker at changing behaviour). Second, there is some risk that the presence of a RGIC in a gambling venue may diminish the onus on gambling venue staff to identify and intervene with at-risk gamblers. This would be unfortunate, as venue employees have considerably greater interaction with at-risk gamblers than do RGIC employees.

## POLICY INITIATIVES TO PREVENT PROBLEM GAMBLING

Health-oriented policies are measures taken by governments and industry intended to inhibit the adoption of risk gambling practices and cognitions and the subsequent onset of problems, or to promote the adoption of low risk (or self-protective) practices and cognitions. Policies can be organized into three categories: restrictions on the general availability of gambling; restrictions on who can gamble; and restrictions on how gambling is provided. As there is considerable evidence on this issue, the focus is primarily on research that reports actual changes in behaviour as a measure of effectiveness.

### Restrictions on the General Availability of Gambling

Greater availability of a product is typically related to greater use of the product, especially among those with dependency-forming potential. Thus, alcohol availability is positively associated with higher levels of consumption, which is correlated with higher levels of alcohol-related problems (Cook & Moore, 2002; Gruenewald, Ponicki, & Holder, 1993; Rush, Gliksman & Brook, 1986). Similarly, jurisdictions with higher levels of gun ownership have consistently higher rates of gun-related violence (Ajdacid-Gross et al, 2006; Hepburn & Hemenway, 2004; Killias, van Kesteren, & Rindlisbacher, 2001). It is important to note that these relationships are not perfect, nor are they simple. For example, there are circumstances where alcohol consumption can decrease despite increases in availability (e.g., Smart & Mann, 1995). Also, the relationship between gun ownership and *overall rates* of homicide and suicide is less consistent, offering some evidence of a substitution effect (Killias et al., 2001), although this interpretation is contested by some (Hepburn & Hemenway, 2004).

Evidence would suggest that gambling availability has a similar positive, but complex relationship to problem gambling prevalence. First, there is a strong within-country association between the availability of gambling and the prevalence of problem gambling (Lester, 1994; National Gambling Impact Study Commission [NGISC], 1999; Productivity Commission, 1999; Shaffer, LaBrie, & LaPlante, 2004; Welte, Wieczorek, Barnes, Tidwell, & Hoffman, 2004). Moreover, the expansion of legalized gambling in the 1980s and 1990s was followed by significant increases in problem gambling in the United States (National Research Council [NRC], 1999; Shaffer, Hall, & VanderBilt, 1997). However, it also seems clear that a) there are many other important factors that also influence the problem gambling prevalence rate, and b) the relationship between gambling availability and problem gambling is not a linear one; jurisdictions may show increased rates of problem gambling initially, followed by stable or decreased rates after time (Hodgins, 2005; Shaffer et al., 2004).<sup>5</sup>

Because of the significant relationship between availability and problem gambling prevalence, it comes as no surprise that restricting gambling availability is a policy often used to prevent problem gambling by lowering the rate of onset or incidence. To this end, total gambling

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<sup>5</sup> There is also evidence that the average level of gambling activity in a jurisdiction also predicts the jurisdiction's level of excessive activity or problem gambling (e.g., Grun & McKeigue, 2000; Chipman, Govini & Roerecke, 2006). This is known as the 'single distribution theory' (Rose, 1985), which has been shown to have applicability in predicting rates of alcoholism. If this is also true for gambling, then studies that have reported increases or decreases in average gambling expenditure also indirectly report on the rates of problem gambling.

prohibition is one option, and does occur in a few jurisdictions (e.g., American states of Utah and Hawaii; Cuba; Pakistan; countries where the Islamic religion predominates). Discussing the pros and cons of total prohibition are beyond the scope of this paper, and, in any case, most jurisdictions opt for less drastic measures as discussed below.

### Restricting the Number of Gambling Venues

Most countries require licenses for providers, but do not specify restrictions on the number of bingo halls, horse race tracks, or lottery ticket sales outlets. It is much more common practice to put restrictions on casino numbers and EGMs. Caps on numbers of casinos and/or gambling houses occur in Austria, Belgium, Italy (capped at 4, the lowest of all European jurisdictions), the United Kingdom (the highest cap at over 150), the Netherlands, Portugal, Slovenia, and Sweden (Sychold, 2006). A maximum of 40 casinos is allowed in South Africa, with 32 venues currently operational (National Gambling Board, 2005). In Canada, certain provinces (e.g., British Columbia, Ontario) have capped the number of casinos.

Venue caps make theoretical sense considering the positive association between product availability and product consumption. Specific evidence of their association with problem gambling is seen in the following:

- In the U.S., the NGISC (1999) found that living within 50 miles of a casino is associated with a 50% higher rate of pathological gambling.
- Welte et al. (2004) independently demonstrated a positive relationship between problem gambling in the United States and the existence of a casino within 10 miles of the gambler's home.
- Lester (1994), in a U.S. wide study, found that the opportunity to gamble at casinos with slot machines, on sports betting, at jai alai, and in teletheaters was associated with being in a state with a greater per capita prevalence of Gamblers Anonymous (GA) chapters.
- Within Canada, Table 1 presents data demonstrating a significant positive relationship between provincial casino/racino density and provincial rates of problem gambling in 2002. There are also positive relationships between problem gambling rates and the density of bingo licenses and horse racing venues. Interestingly, there is no association with the number of EGM locations, and there is a negative association with the number of lottery outlets.



Table 1. Correlates of Canadian Provincial Problem Gambling Prevalence in 2002.

	NB	QU	PEI	NF	BC	ONT	NS	AB	SK	MB	Correlation with PG Prevalence
Problem Gambling Prevalence <sup>1</sup>	1.5	1.7	1.9	1.9	1.9	2.0	2.0	2.2	2.9	2.9	
Casino/Racinos (C/R) per 100000 adults	0	.12	0	0	.59	.26	.27	.77	.94	.46	$r = .74^*$ $\tau\text{-}b = .63^*$
EGMs per 100000 adults	433	341	388	633	102	213	591	471	758	807	$r = .68^*$ $\tau\text{-}b = .42$
Casino Table Games per 100000 adults	0	3.6	0	0	12.1	5.9	7.6	17.5	13.6	7.8	$r = .56$ $\tau\text{-}b = .59^*$
Horse Racing Venues per 100000 adults <sup>2</sup>	.68	.60	1.91	.24	.65	1.11	1.36	2.26	1.21	2.30	$r = .56$ $\tau\text{-}b = .52^*$
Bingo Licenses per 100000 adults	57	40	37	138	N.A.	22	74	105	230	56	$r = .53$ $\tau\text{-}b = .20$
EGMs outside of C/Rs per 100000 adults <sup>3</sup>	433	237	388	633	0	0	441	255	507	582	$r = .35$ $\tau\text{-}b = .22$
% Revenue on Prevention/Treatment <sup>4</sup>	.59	1.25	.63	.38	.48	1.20	1.22	.52	1.53	.71	$r = .32$ $\tau\text{-}b = .24$
# locations EGMs occur outside C/Rs per 100000 adults	111	62	87	138	0	0	73	50	93	67	$r = -.02$ $\tau\text{-}b = -.12$
Lottery Outlets per 100000 adults	175	180	177	323	128	113	181	90	104	97	$r = -.50$ $\tau\text{-}b = -.47$

1. As established by a Canadian Problem Gambling Index (CPGI) score of 3 or higher. The CPGI was administered as part of the Canadian Community Health Survey (1.2) (May – Sept 2002; n = 34,770).
2. Racetracks and Teletheatres.
3. Electronic Gambling Machines outside Casinos or Racinos for every 100,000 adults aged 18 and older.
4. Percentage of provincial government gambling revenue spent on prevention and treatment of problem gambling.

\* Correlation significant at the .05 level (2 tailed)

Note. Unless otherwise stated, all data comes from the Canadian Gambling Digest, published by the Canadian Partnership for Responsible Gambling (2004) and the 2001 Statistics Canada Census. All data from the Canadian Gambling Digest pertains to the period April 2002 to March 2003.

Provinces are New Brunswick (NB), Quebec (QU), Prince Edward Island (PEI), Newfoundland & Labrador (NF), Ontario (ONT), Nova Scotia (NS), Alberta (AB), Manitoba (MB), Saskatchewan (SK).

Before versus after comparisons of the impact of venue openings is also relevant to this issue:

- Room, Turner, and Ialomiteanu (1999) found that Casino Niagara's opening in Ontario in 1996 brought an increase in gambling and reported gambling problems one year later among Niagara Falls residents. Toneatto, Ferguson, and Brennan (2003) also found that the casino opening was associated with increased South Oaks Gambling Screen (SOGS) scores for residential substance abusers who gambled most frequently on casino gambling in 1997 and 1998.
- Jacques, Ladouceur, and Ferland (2000) found that, as opportunities for casino gambling become available in two Quebec communities in 1996, there was increased participation rates and spending on casino gambling by local citizens and an increase in problem (i.e., less severe) but not pathological (more severe) gambling. These impacts were not seen at 2- and 4-year follow-up, although attrition rates were as high as 75% by 2002 (Jacques & Ladouceur, 2006).
- Govoni, Frisch, Rupcich, and Getty (1998) found that Casino Windsor's opening in Ontario in 1996 produced no significant change in Windsor residents gambling expenditure or rate of problem gambling one year later.
- Hann and Nuffield (2005) found that the opening of four casinos and one racino in Ontario in 1999 and 2000 produced an increase in the rate of probable *pathological* gamblers in these communities from 1.5% to 2.5% (although no change in the rate of problem gamblers at 2.4%).
- Blue Thorn Research, Population Health, and Williams (2007) found that the introduction of two new casinos and one new racino into the British Columbia Lower Mainland in 2004/2005 resulted in no change in the problem gambling prevalence rate in Vancouver, Surrey or Langley Township when examined 1.5 to 2 years later. However, rates did increase in the city of Langley. These authors attributed this differential effect to the extensive availability of casino gambling in Vancouver and Surrey prior to the introduction of these new venues (associated with a high baseline rates of problem gambling in these communities), compared to less availability of casino gambling and a low baseline rate of problem gambling in the city of Langley.

It is important to recognize that the stable problem gambling prevalence rates found in Govoni et al. (1998) and Blue Thorn et al. (2007) still provide good evidence that gambling availability is causing *increased* problem gambling in the population. Although severe levels of problem gambling ('pathological gambling') are reasonably stable over time (e.g., Hodgins & Peden, 2005; Slutske, 2006), moderate levels of problem gambling (which are much more common) are not. Studies have found that the large majority of 'moderate' problem gamblers are no longer problem gamblers at 1-year follow up (Wiebe, Cox, & Falkowski-Ham, 2003) or 7-year follow up (Abbott, Williams & Volberg, 1999). Stable rates of problem gambling from time 1 to time 2 therefore indicate the existence of a large group of newly affected individuals roughly equivalent to the number of individuals who have recovered or remitted.<sup>6</sup>

### Restricting More Harmful Types of Gambling

It is a common policy to prohibit or restrict inherently more 'dangerous' forms of a product. For example, in many countries handguns, assault rifles, and automatic weapons are prohibited, whereas hunting rifles are legally available. Similarly, drugs with greater perceived potential for addiction (e.g., cocaine, methamphetamine, heroin) tend to be illegal in most countries, with substances perceived as less harmful being legally available (e.g., alcohol).

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<sup>6</sup> For the same reason, the relatively stable problem gambling prevalence rates in North America in the past 15 years is evidence that continued gambling availability is producing large numbers of new problem gamblers every year, thereby significantly increasing lifetime prevalence of this condition in the population.

Electronic gambling machines are the form of gambling consistently identified by problem gamblers, treatment agencies, and gambling researchers as creating the most problems in nearly all Western countries (e.g., Dowling, Smith, & Thomas, 2005; Smith & Wynne, 2002). Some would argue that there is a good reason these devices have been illegal for most of the time in a majority of countries since first becoming available. Internet gambling is another form of gambling with an unusually high association with problem gambling (Wood & Williams, 2007a; 2007b). Internet gambling is prohibited in several jurisdictions (e.g., U.S., South Korea) because of concerns with its potential for harm. Unfortunately, prohibition of Internet gambling usually serves limited deterrent value because of enforcement difficulties.

Currently, EGM gambling is prohibited or does not occur in some jurisdictions (e.g., 15/50 U.S. states did not have EGMs in 2006), and there is some empirical evidence regarding the impact of EGM bans in two American states: South Dakota and South Carolina. In 1994, South Dakota's 7,859 legal EGMs were declared unconstitutional, shut down for three months, and then reinstated by public referendum (Rose, 2003). In the 11 months prior to the ban, 4 substance abuse treatment centres averaged 68 inquiries and 11 problem gambling clients per month. During the shutdown, there were only 2 inquiries and 2 people treated among all four centres. In the 3 months after EGM reinstatement, the centres averaged 24 inquiries and treated 8 gamblers per month (Carr, Buchkoski, Kofoed, & Morgan, 1996). In 2000 the 36,000 legal EGMs in South Carolina were banned. Following the ban there was a significant increase in seizures of illegal machines, from 48 in 2000-2001 to 1,551 in 2004-2005 (South Carolina Law Enforcement Division, 2005). Nonetheless, the number of active Gambler's Anonymous groups fell from 32 to 16 within 90 days of the shutdown, with several of the remaining active groups reporting the size of their group meetings decreasing from 40 to 1 or 2 (Bridwell & Quinn, 2002). Additionally, the most active gambler's hotline in the state reported that calls fell from 200 a month to zero. These reductions have been maintained in subsequent years. Current directory information for Gamblers Anonymous (2006) indicates 10 active GA groups in South Carolina. Additionally, less than 1% of the 4,500 calls made to the South Carolina Gambling Helpline since its inception in 2004 have been related to problems with EGMs (J. Mount, personal communication, August 4, 2006).

Other machine bans are pending or in progress that could potentially provide more evidence on this issue. North Carolina legislated a phased-out ban starting in October 2006 (Eisley & Allegood, 2006). Portugal and Latvia intend to eliminate EGM gambling in 2007 (Sychold, 2006). Trinidad and Tobago have banned slot machines effective late 2007.

Placing a limit on the total number of EGMs is another variant on this policy strategy. Again, this makes theoretical sense given that there is a strong positive relationship between EGM numbers per capita and problem gambling rates. For example, Australia has the world's highest per capita EGM ratio (~1 machine for every 99 people) (excluding smaller, tourist-oriented countries such as Monaco), as well as one of the world's highest rates of problem gambling (Productivity Commission, 1999). Within Australia, there is also a significant positive relationship between number of machines and regional problem gambling rates (Productivity Commission, 1999; South Australian Centre for Economic Studies [SACES], 2005). The same is true in Canada, as demonstrated by the significant positive correlation between provincial problem gambling prevalence rates and EGMs per 100,000 adults ( $r = .68, p < .05$ ) seen in Table 1.

It appears that reductions in EGM numbers do not have a significant impact if they do not substantially change overall EGM availability. A study by SACES (2005) investigated the impact of regional restrictions on EGM numbers in the state of Victoria. Findings indicated that gambler losses

were not generally reduced, help-seeking by problem gamblers did not change, and there were no sustained revenue losses in venues where machines were removed. However, the authors pointed out that the areas with new caps tended to be areas with the highest EGM per capita ratios to begin with, and the magnitude of the reductions was small. Similarly, a 25% reduction in EGMs outside casinos ('video lottery terminals') in Nova Scotia, Canada in November 2005 is said to have resulted in a relatively small reduction in revenue (Flinn, 2006).

### Limiting Gambling Opportunities to Gambling Venues

"Convenience gambling", whereby gambling opportunities are available outside dedicated gambling venues, is sometimes cited as an important factor in the development of problem gambling. In Europe, EGM gambling is prohibited outside dedicated gambling venues in Cyprus, France, Greece, and Luxembourg, and is banned from 'low barrier' locations (e.g., bars; lounges; clubs) in Lithuania, Latvia, and the Netherlands (Sychold, 2006). In the United States, only five states allow EGMs outside of gambling venues: Louisiana, Montana, Nevada, Oregon and West Virginia (American Gaming Association, 2006). In Canada, 2 out of 10 provinces do not permit EGMs outside of gambling venues: Ontario and British Columbia. In Australia, the state of Western Australia does not permit EGMs outside its one casino.

The unique impact of limiting gambling opportunities to gambling venues is difficult to determine, as jurisdictions that utilize the policy also tend to have fewer total EGMs and sometimes are less accepting toward gambling in the first place. An example is Western Australia, where the prevalence rate of problem gambling is the lowest in all of Australia, but also where the ratio of 99 EGMs per 100,000 adults is the lowest (SACES, 2005).

In Canada, the provinces of Ontario and British Columbia allow no EGMs outside of dedicated gambling venues and also have the lowest ratio of EGMs per 100,000 adults. As seen in Table 1, they still have 'mid range' problem gambling prevalence rates, perhaps due to the fact they have the highest number of casinos/racinos in the country (25 and 19 respectively in 2002). The lack of EGMs outside casinos/racinos also likely explains why residents of these two provinces patronize EGMs within casinos/racinos at a higher rate than any other province, 28% and 22% respectively (Canadian Partnership for Responsible Gambling, 2004; Blue Thorn et al., 2007).

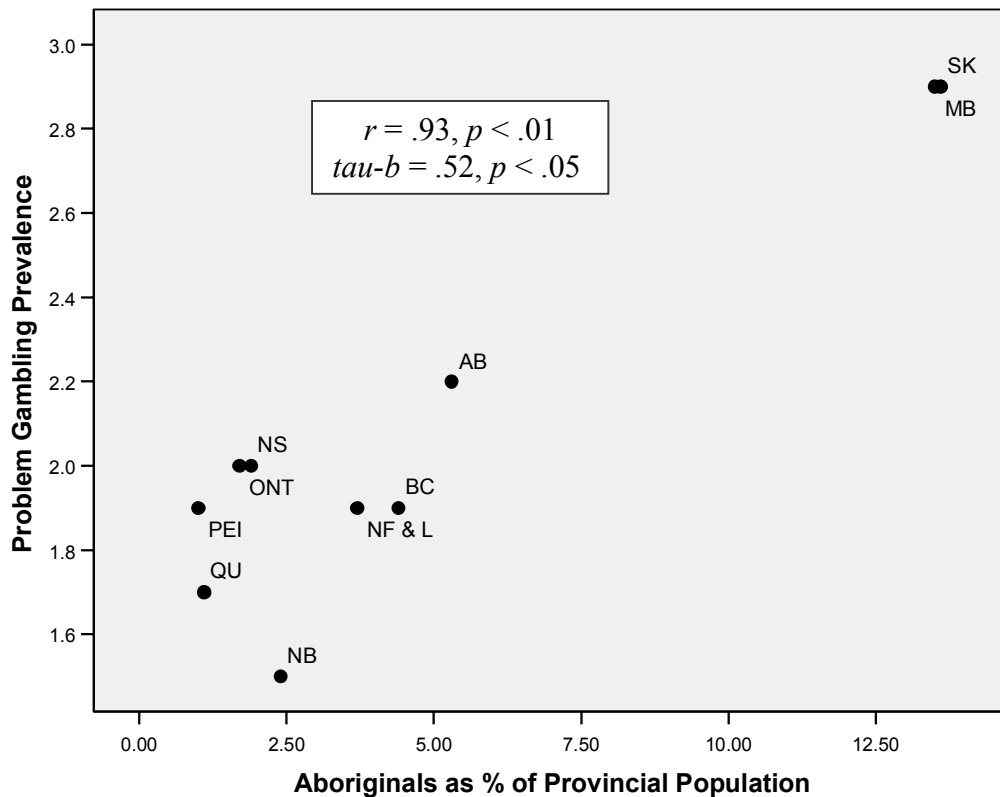
The overall relationship is relatively weak between provincial problem gambling prevalence rates in Canada, and the number of EGMs outside of gambling venues per capita ( $r = .35$ , ns), and nonexistent between problem gambling prevalence rates and the number of EGM locations per capita ( $r = -.01$ , ns) (see Table 1) (this is true even when removing ONT and BC from the correlations). In the United States, there is no significant difference in the rates of problem gambling in states with EGMs outside casinos ( $n = 4$ , prevalence = 4.1%) compared to states without EGMs outside casinos ( $n = 24$ , prevalence = 3.9%),  $t(26) = .17$ ,  $p = .86$ . These results are somewhat surprising considering the fact that increasing the number of alcohol outlets per capita tends to increase alcohol consumption (Wagenaar & Holder, 1995; Wagenaar & Langley, 1994). However, what these results perhaps indicate is that each available EGM represents an independent 'outlet' as opposed to each place where EGMs are located. Thus, total EGMs per capita may continue to be a much better predictor of jurisdictional problem gambling prevalence rates. A corollary of this point is that concentrating gambling opportunities within gambling venues may simply result in corresponding local concentrations of problem gambling (e.g., Shaffer et al., 2004).

## Restricting the Location of Gambling Venues

Historically, casinos in Europe and the United States were placed in tourist destinations away from major urban centres. This is still the case in Asia and Africa. The historical rationale for this was that casinos would be deleterious for urban, working-class populations, and that the economic benefits of casinos are most apparent when they draw new money and wealth into the community rather than redirecting money from other local businesses (Grinols, 2004; McMillen, 1998). The other major benefit of ‘outside’ patronage is that the social problems created by gambling go home with the tourist, rather than impacting the local social service and health care system. These social and economic principles still appear to be sound, despite the tendency to locate most casinos in urban centres in recent years.

An additional consideration concerning placement of gambling venues is the fact that some groups of urban residents are much more vulnerable to problem gambling than others. In general, poorer neighbourhoods are positively associated with problem/pathological gambling (Welte et al., 2004). For individuals, Rush, Adlaf, Veldhuizen, Corea, and Vince (2005) (also in Rush, Veldhuizen, & Adlaf, 2007) found that substance abuse and demographic factors were the strongest predictors of problem gambling status (stronger than gambling venue proximity). In Canada, the national prevalence study of gambling in 2002 (Canadian Community Health Survey (CCHS) 1.2), found that people with less education, and those of Aboriginal descent have significantly higher risk of problem gambling (Marshall & Wynne, 2003). As seen in Figure 2, the Canadian provincial problem gambling prevalence rate is in fact *best* predicted by proportion of the population with Aboriginal ancestry ( $r = .93, p < .01$ ). Almost equally strong is the relationship between provincial rates of alcohol dependence (established in the same CCHS 1.2 survey) and problem gambling prevalence ( $r = .74, p < .05$ ).

Figure 2. Aboriginal Ancestry as it Relates to Canadian Provincial Problem Gambling Prevalence in 2002.



Problem gambling prevalence established by a Canadian Problem Gambling Index (CPGI) score of 3 or higher. The CPGI was administered as part of the Canadian Community Health Survey (1.2) (May – Sept 2002; n = 34,770).

Provinces are New Brunswick (NB), Quebec (QU), Prince Edward Island (PEI), Newfoundland & Labrador (NF&L), Ontario (ONT), Nova Scotia (NS), Alberta (AB), Manitoba (MB), Saskatchewan (SK).

Aboriginal population figures from the Statistics Canada 2001 Census.

### Limiting Gambling Venue Hours of Operation

Policies to limit the number of hours that patrons may gamble in any twenty-four hour period are intended to reduce harm associated with extended play. Restrictions may apply either to gambling venues or to certain types of gambling. For example, EGMs in Alberta may operate for 17 consecutive hours, and table games for 14 hours (although poker rooms in casinos remain open around the clock). The two casinos in Winnipeg, Manitoba are open from 10:00 A.M. to 10:00 P.M. daily during the summer months, and 10:00 A.M. to dusk the remainder of the year. Gambling venues in the Australian Capital Territory are closed from 4:00 A.M. to 7:00 A.M. daily, while in Queensland, venues are required to close between 4:00 A.M. and 10:00 A.M., with time variation possible on application; South Australian gambling machine clubs must close for a minimum of 6 hours each day. Elsewhere around the world there is wide variation, with some venues being open around the clock and others shutting down nightly.

As with most other preventative gambling initiatives, information is limited regarding the effectiveness of hours-of-operation restrictions. The province of Nova Scotia shut-down of EGMs outside of casinos at midnight resulted in a *self-reported* 18% reduction in spending among a random

sample of problem gamblers. Actual revenues only declined about 5.1 - 8.7% (Nova Scotia Gaming Corporation, 2005). In Australia, hours of operation restrictions currently apply in seven states and territories. However, as reported by the Centre for Gambling Research (2005), the large majority of venue operators reported no effectiveness of the short shut-down periods. Notably, the shut-downs occur at times of day when the patronage is already at its lowest.

Reduced hours of operation still make theoretical sense considering a) the general premise that reduced availability leads to reduced problems, and b) evidence in the alcohol field that restricted hours and days of operation reduce social harm (Babor et al., 2003; Chikritzhs & Stockwell, 2006). However, similar to reductions in EGMs, *unless availability reductions are meaningful and substantial, it seems unlikely that an overall beneficial impact will be obtained.*

## Restrictions on Who can Gamble

### Prohibition of Youth Gambling

Worldwide, it is a common policy to restrict gambling to individuals who are of legal adult age (Rose, 2001). There are some important regional variations on this policy. For example, there are no age limits to play electronic gambling machines ('fruit machines') with low prize limits in the United Kingdom. Sixteen year olds can purchase lottery tickets in England and Finland. A few U.S. states (and Alberta, Canada) permit bingo playing at age 16 (NRC, 1999). There is also wide variation on enforcement. In general, enforcement tends to be good in situations where gambling occurs in adult-only venues (e.g., casinos, bars/clubs/lounges) and poor in situations where gambling opportunities are available in public locations. Consequently, North American and Australian youth tend to have low rates of casino table game and gambling machine play (only available in adult venues), but high rates of lottery and scratch ticket play (available in public locations) (Delfabbro, Lahn, & Grabosky, 2005; Felsher, Derevensky, & Gupta, 2004; Jacobs, 2004). In contrast, gambling machine play is among the most common gambling activity among youth in Nordic countries, as these machines are available in public locations (Johansson & Gotestam, 2003; Olason, Sigurdardottir, & Smari, 2006).

The prevalence of gambling and problem gambling between youth in different jurisdictions is difficult to compare or even definitively establish, because of the use of different instruments (i.e., SOGS, SOGS-RA, DSM-IV, DSM-IV-MR-J), as well as serious concerns about whether these instruments overestimate true prevalence rates (e.g., Ladouceur et al., 2000; Pelletier, Ladouceur, Fortin, & Ferland, 2004). That being said, there are some interesting observations that can be made about these obtained rates. First, despite prohibition, the past year prevalence of both gambling (~70-90%) and problem gambling (~2-6%) appears to be at least as high, if not higher than adult rates (Rossen, 2001; Shaffer & Hall, 2001). Second, there do not appear to be any obvious differences in prevalence rates between jurisdictions, despite significant variations on availability and enforcement (Rossen, 2001; Shaffer & Hall, 2001). Finally, it is somewhat surprising to note that countries where youth have greater access to gambling opportunities (e.g., U.K.; Nordic countries) tend to have somewhat lower rates of adult problem gambling. Here again, differences in instrumentation, response rates, etc. may account for apparent differences in adult problem gambling rates. Furthermore, even if these differences are real, there are many things that could account for them (e.g., European electronic gambling machines tend to have low stakes and low prize limits).

However, it is also worth considering whether early exposure to gambling could have beneficial effects. The analogy here is the oft cited lower rate of adult alcoholism in many countries where children are exposed to alcohol at an early age (e.g., China, Israel, southern European countries such as Italy) (Heath, 1995; Pittman & White, 1991). However, it is important to note that early

exposure by itself is not sufficient and in some cases is quite harmful. Indigenous populations and countries such as France have very high rates of alcoholism despite early exposure. Rather, what is common among cultures with low rates of alcoholism is a) early positive exposure and b) ongoing promotion and modelling of moderate use in the context of family, meals, and/or religious service, as well as cultural taboos against drunkenness (Heath, 1995; Pittman & White, 1991). It is also important to note that any cultural practice which promotes widespread drinking is potentially problematic, as there is a strong association between a country's overall alcohol consumption and its level of health problems (National Institute of Public Health, 2002).

### Restricting Venue Entry to Non-Residents

Some countries do not permit local residents to gamble at casinos. Examples include France, the Bahamas, Malaysia, and Nepal. Australia does not permit residents to gamble at its government licensed online casino (Lasseters) although it does permit its citizens to wager money with Australian online sports and race books, poker rooms, lottery sites, and skill game sites. In other countries, resident access is severely restricted. For example, South Korean citizens are only allowed to gamble at one of South Korea's fifteen casinos (Back, 2006). The rationale for this policy is the same as the rationale for locating casinos in tourist areas: to ensure that casino revenues come from outside the jurisdiction and to protect the local populace from social harm.

Although theoretically sound, there is a lack of empirical evidence on the effectiveness of this policy in preventing problem gambling amongst the citizenry. It is clear that gambling is still common in some countries where this policy exists. Anecdotally, South Korea is said to have high rates of problem gambling.

### Restricting Venue Entry to Higher Socioeconomic Classes

Dress codes requiring formal attire exist in some European countries, partly to maintain the sophisticated ambience, and partly to cater to the higher socioeconomic classes. Significant entry fees are required in some countries (e.g., Papua New Guinea), which are intended to have the same effect. Recently, a bill has been proposed in Panama to restrict entry to the 13 Panamanian casinos to people with incomes of >\$1,000 U.S. per month (Yogonet.com, 2006).

Socioeconomic status (in western countries) is a fairly weak predictor of problem gambling status. Nonetheless, anything that effectively reduces overall gambling patronage would also likely reduce overall problem gambling prevalence.

### Casino Self-Exclusion<sup>7</sup>

The first formal casino self-exclusion program was initiated in 1989 in Manitoba, Canada, coincident with the opening of the country's first permanent, year-round casino. In the Netherlands, Holland Casino developed a program in 1990. In the United States, a tribal casino in Connecticut implemented a self-exclusion program in 1994, and Missouri developed the first state-wide program in 1996. Since that time, many casinos and jurisdictions around the world have adopted self-exclusion programs. Several Internet gambling sites also offer self-exclusion programs (Wood & Williams, 2007a).

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<sup>7</sup> Casino self-exclusion is another 'tertiary' prevention initiative, as it is primarily utilized by existing problem gamblers to minimize further harm.



The effectiveness of self-exclusion programs can be measured in three ways. The first consideration is utilization rate. On the basis of self-exclusion data for seven Canadian provinces with casinos (as provided by regulatory agency staff to one of the authors (BW) in 2005), between 0.6% and 7.0% of problem gamblers signed up to self-exclude, depending on the province. These fairly low utilization rates are similar to what has been reported in Australia and the United States (SACES, 2003). One European jurisdiction with significantly higher rates is the Netherlands, due to the proactive nature of their program, where individuals with high rates of casino patronage are approached to see if they wish a ‘visit limitation’ or casino exclusion contract (Bes, 2002; De Bruin et al., 2001; Nowatzki & Williams, 2002).

Another measure of effectiveness concerns the percentage of self-excluded people who do not actually re-enter the casino(s) during the contracted period of exclusion. Evidence is very limited on this topic. Ladouceur et al. (2000) studied 220 individuals self-excluded from a Quebec casino. A subset of 53 went back to renew or re-establish a self-exclusion contract. Of this group, 64% reported not entering the casino during their previous exclusion period. However, the 36% who did return reported going back a median of six times. Steinberg and Velardo (2002) studied a small subset (n=20) of the 294 self-excluders at the Mohegan Sun Casino in Connecticut. Here again, most reported they did not return to the casino during the period of exclusion, but the majority of the 20% that did return went back more than 9 times. A review of self-exclusion in Victoria, Australia also concluded that a significant number of self-excluders re-enter casinos without being detected (O’Neil et al., 2003). Much higher compliance occurs in the Netherlands where personal identification is required to enter any of the 12 casinos operated by Holland Casino. A computer system registers all visits and immediately identifies anyone who has requested a ban or visit limitation (Bes, 2002; De Bruin et al., 2001).

A final measure of effectiveness concerns the impact self-exclusion has on overall gambling behaviour. Again, very little is known here. Of the 53 individuals who went back to renew a self-exclusion contract at a Quebec casino, only 30% reported they had stopped gambling completely during their previous contract (which had typically been for a period of 6 to 12 months) (Ladouceur et al., 2000). Two previous studies reported that about half of self-excluded patrons found other ways to gamble, such as illegal gambling or electronic gambling machines outside of casinos (De Bruin et al., 2001; Ladouceur et al., 2000). Furthermore, a study completed in the Netherlands found that a large percentage of people who requested a ban or visit limitation eventually returned to the casino following the period of restriction. Some had a sharp increase in visiting frequency in the ensuing six months, although the frequency of most people stabilized over time to fewer than eight visits per month (De Bruin et al., 2001). A more positive evaluation was obtained by Ladouceur, Sylvain, & Gosselin (2007) who conducted a 6, 12, 18, and 24 month follow-ups of 161 self-excluders in Quebec. Follow-up evaluations found self-excluders to have significant reductions in urge to gamble, the intensity of negative consequences, and DSM pathological gambling scores.

While it is apparent that casino self-exclusion contracts have some preventive value in containing harm to established problem gamblers, it is also apparent that they could be a lot more effective.<sup>8</sup> Nowatzki and Williams’s (2002) review of self-exclusion programs identified the following areas in need of improvement:

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<sup>8</sup> It is sometimes pointed out that exclusion contracts do not exist for alcohol sales or service. However, a historical variant on this policy was the prohibition on selling alcohol to Indians in the United States prior to 1937. Similarly, after alcohol prohibition was repealed in North America, many states and provinces retained very restrictive practices over alcohol sales and service. For example, in Iowa to purchase alcohol you had to show your ‘Liquor Book’ that recorded all your alcohol purchases in the past year. If your purchases were judged excessive, the clerk had the right to refuse to sell you alcohol (this law was only officially repealed in 1963). More recently, a New Mexico lawmaker has proposed

1. *Mandatory and Aggressive Promotion.* Many problem gamblers are still unaware of these programs.
2. *Irrevocable Bans.* Revocable bans (which are common) defeat the purpose of self-exclusion, which is to set up enduring external constraints for people attempting to curb their gambling, usually after efforts at self control have failed. Evidence also indicates that patrons prefer irrevocable bans.
3. *Wide Range of Ban Lengths.* The appropriate length of abstinence required to prevent problem gambling relapse is unclear. However, for substance abuse, abstinence of 3 to 6 months is commonly achieved but has almost no predictive value in preventing relapse. Rather, periods greater than 2 years are necessary to prevent relapse in most cases. For alcohol abuse, 25% will still relapse after four years of abstinence and 7% will still relapse after 6 years (Vaillant, 1995). Thus, from a clinical perspective, it might be prudent for casino ban lengths to be for a minimum of 5 years. On the other hand, this minimum length may deter some people from entering into self-exclusion. Currently, many bans range from 6 months to lifetime.
4. *Application to all Gambling Venues within the Jurisdiction.* Self-exclusion has limited deterrent value if it is only applicable to one venue or one type of gambling. Jurisdiction-wide exclusion is common in Canada (except Quebec) and Europe, but it is less common in the United States and Australia. In Canada, self-exclusion also applies to racinos and bingo halls in some provinces. In Europe, at least one country (the Netherlands) extends self exclusion to its online gambling services (and vice versa). A Global Self-Exclusion Database has been recently developed by a U.S. ID verification company called Aristotle that allows Internet gamblers to ban themselves from all participating Internet gambling operators (Online Casinos.com, 2006).
5. *Computerised Identification Checks for Enforcement of Self-Exclusion.* This is the only method that will guarantee adequate enforcement. Venues report that it is impossible for security personnel to memorize the faces of hundreds of different people (SACES, 2003). In 2007 over 10,000 people were currently self-excluded in the province of Ontario (filling 22 binders) (CBC, 2007). In many European casinos, people show picture identification to enter the premises (driver's license or passport). This is required in at least one Asian casino in Korea (Back, 2006). Although North American casino owners often contend that patrons would not accept such a requirement, showing ID is a common practice to rent a video, cash a cheque, board a plane, etc. In Alberta, several bars have been using ID screening to exclude undesirable patrons for several years ([www.barlink.ca](http://www.barlink.ca)). In a compromise between the Illinois Gaming Board who wanted ID screening for self-exclusion contracts, and the casino industry that did not, Illinois started requiring ID for anyone who looks 30 or younger in August 2006 (Fusco, 2006). Biometric facial identification is a technology that some North American casinos use for identification of card counters, cheats, and 'high rollers' (Market Wire, 2000), but which could also be extended to detect self-excluders. Computerized identification checks would also enable 'visit limitation contracts', as opposed to total bans, as is done in the Netherlands (Bes, 2002).
6. *Legal Liability and Penalties for both the Venue and the Gambler upon Breach of Contract.* There needs to be an incentive for both parties of a contract to abide by its conditions. Even though penalties to the gambler are often stipulated in these agreements (e.g., fines, confiscation of winnings, trespassing charges), they are rarely applied (Nowatzki & Williams, 2002). Mandatory identification for wins over a few hundred dollars combined with automatic confiscation of winnings for barred self-excluders would eliminate much of the incentive to violate bans. Gambling venues consider themselves absolved of any legal responsibility in the event that a self-exclusion contract is breached (their perspective is that these are 'agreements',

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banning alcohol sales to people convicted of driving while intoxicated (Wines & Vines, 2005). Australia has plans to ban alcohol sales to Aborigines in the Northern Territory (CNN.com, 2007).

rather than legally binding ‘contracts’). To date, courts in the United States and Australia have agreed with this position. This has not always been the case elsewhere. In 2003 the Appeals Court of Austria ruled against Casino Austria, stating that the casino had an obligation to refuse entry to players whose financial solvency was in question (Rhea, 2005). In Ontario, the Ontario Lottery and Gaming Corporation has settled nine self-exclusion cases out of court in recent years, in favour of the patron (CBC, 2007; Rhea, 2005). Many observers believe it is only a matter of time before the legal ‘duty of care’ established for alcohol providers (e.g., U.S. Dram Shop liability laws; Canadian Supreme Court 1973 Menow ruling) is also firmly established under common law for gambling providers (Hillyer, 2003, as cited in Sasso & Kalajdzic, 2006).

7. *Optional counselling and a mandatory gambling education seminar prior to reinstatement.* Problem gamblers who sign exclusion contracts have taken an important first step, but many would also benefit from counselling or treatment (Sani, Carlevaro, & Ladouceur, 2005). Thus, counselling should be offered and encouraged to everyone who enters into a self-exclusion contract. In Manitoba, individuals are required to attend a responsible gambling awareness seminar prior to re-entry (review of past gambling history, information on how gambling works, plan for returning to gamble).

### Restrictions or Alterations on How Gambling is Provided

#### On-Site Intervention with ‘At-Risk’ Gamblers

Several different initiatives have attempted to provide therapeutic interventions to at-risk and problem gamblers at the gambling venue itself. This makes a lot of theoretical sense considering that a) a significant portion of gambling venue patronage consists of problem gamblers (e.g., Fisher, 2000; Gerstein et al., 1999), and b) only a small minority of problem gamblers ever seek treatment (Hodgins & el-Guebaly, 2000). Following is a description of on-site initiatives and what is known about their effectiveness.

#### Employee Problem Gambling Awareness Training

In recent years problem gambling awareness training for employees of gambling venues has been initiated in many countries. The purpose of these programs is to increase employee recognition of problem gambling among patrons and to direct these patrons to appropriate treatment resources. Programs are variously delivered by venue owners/operators, departments of health/addiction agencies, contracted companies, or combinations of the foregoing. Program design tends to be based on collaborative consultation between government, gambling industries, and prevention/treatment agencies. Staff training is mandatory in several jurisdictions and is sometimes also required of EGM site holders/staff and lottery retailers. Front line employees at casinos typically receive a one-time knowledge and skill development session to understand and recognize problem gambling behaviours in patrons so as to alert their supervisors to these individuals. More extensive training is typically provided for supervisory and management personnel at casinos, whose responsibilities include approaching the identified individual to offer immediate crisis management or treatment referral.

Holland Casinos was the first gaming provider to provide an intensive training and education program for employees beginning in the late 1980s (d’Hondt, 2007). Manitoba, Canada was one of the first North American jurisdictions to implement an employee training program, beginning in 1998. Since that time all Canadian provinces have implemented either mandatory or voluntary programs. Awareness training for employees also exists in other countries. In South Africa, the National Responsible Gambling Program (a collaborative public/private initiative), encourages and provides voluntary industry staff training. Harrahs, in the United States, has operated ‘Operation Bet Smart’ for

several years (Harras Entertainment, 2004). Staff training is in fact part of the American Gaming Association's Code of Conduct for Responsible Gaming, enacted in 2003. The European Casino Association's Code of Conduct has similar provisions and was ratified by the twenty member countries in January 2006. The World Lotteries Association Code of Conduct also includes a problem gambling employee training component. New Zealand's 'Host Responsibility Training' (a model of responsible gambling on which venue licensing is conditional) includes a mandatory staff training component.

Research on the effectiveness of training programs is limited. The Addictions Foundation of Manitoba found that 98% of 1,550 video lottery terminal (VLT) site-owners and employees reported finding the training useful (Smitheringale, 2001). The only known evaluation that included any sort of behavioural measure was conducted by Ladouceur et al. (2004). These investigators found that VLT retailers in Quebec reported greater confidence in recognizing and addressing problem gambling after receiving a 2 hour problem gambling awareness workshop, and also reported approaching problem gamblers more frequently than new retailers who had not yet attended the workshop.

A comparable, well researched initiative is training of alcohol servers to not serve intoxicated patrons. A systematic review of this evidence shows several instances where this training has resulted in the desired effect, but just as many instances where compliance with the training has been poor (Ker & Chinnock, 2006). Some of the main factors interfering with the effectiveness of this training include the likelihood that intervention will compromise profits; the voluntary nature of the training (in some jurisdictions); the lack of enforcement; and a low-skilled work force with high turnover and personal drinking habits that are inconsistent with these interventions (Ker & Chinnock, 2006; Mosher, Toomey, Good, Harwood, & Wagenaar, 2002; Reiling & Nusbaumer, 2006). It is important to note that all of these barriers to compliance also apply to the gambling industry (Dangerfield, 2004; Shaffer et al., 1999; Shaffer & Hall, 2002; Williams & Wood, 2004a, 2007). Screening prospective gaming employees for problem gambling would be a policy initiative that may be help in this regard.

#### Automated Intervention for 'At-Risk' Gamblers

A much more reliable on-site intervention system exists in the Netherlands. The requirement to show ID also allows Holland Casino to track the frequency of casino visitation. If the computer indicates a significant increase in visitation frequency or that the person has had 20 visits a month over the past 3 months then the person is *automatically approached* to see whether they would like to sign a visit limitation contract or self-exclusion contract (Bes, 2002). Only 18.5% of these approaches are perceived negatively by the patron (Bes, 2002). In 2004, a total of 21,360 interviews were held with patrons resulting in 3,155 visit restrictions and 4,423 admission bans (Holland Casino, 2006). Although this type of proactive intervention with 'at-risk' gamblers has not received extensive evaluation, *secondary* prevention (i.e., risk reduction) initiatives that prevent problems from occurring in the first place are always going to be more effective than treating existing problems. An indirect measure of the utility of Holland Casino's approach is perhaps seen in the fact that the number of people seeking help for problem gambling from the official social services is only 50% of what these numbers were in 1995 (Holland Casino, 2006). Furthermore, patron surveys show that only 5% of patrons at any given time are pathological gamblers (2% of all patrons) (d'Hondt, 2007).

Recently, in Canada, a system called 'I-Care' has been jointly developed by iView Systems and the Saskatchewan Gaming Corporation (SGC, 2006). 'Player Club' card activity is used to identify at-risk gambling behaviour combined with facial recognition technology to identify when the player is in the casino. This strategy also provides the venue with the *potential* to intervene with some at-risk players. A related initiative is being piloted by the Ontario Problem Gambling Research

Centre in collaboration with the Ontario Lottery & Gaming Corporation, where high frequency (once a week or more over the past year) members of a loyalty program receive a mailed “brief motivational intervention”. The intention is to educate recipients about impaired control, offer a means for self-assessment, argue that early intervention (before debt becomes unmanageable) is preferable to later intervention, and provide a confidential link to a controlled gambling counselling program. Both initiatives are significant in that they may become components of a “standard of care” that courts accept, either fully or in part, as fulfilling the obligations of providers under a duty of care owed to problem gamblers.

### Modifying EGM Parameters

Because EGMs are associated with the highest problem rates, a number of research studies have investigated initiatives to alter features of EGMs so as to mitigate harm. In most cases, machines with the highest revenue generation continually replace less lucrative machines. Hence it can be expected that current machines have evolved to employ a wide array of characteristics to optimize revenue generation. Following is a summary of research that has attempted to ‘unravel’ some of the feature modifications intended to minimize EGM harm.

#### Reinforcement Parameters

In one of the first laboratory studies of gambling, Lewis and Duncan (1956, 1957, 1958) found that a lower percentage of wins during the trial period produced longer periods of persistent EGM play after the machines no longer delivered wins. Lewis and Duncan (1957) also found that the larger the size of the wins, the longer it took to achieve extinction of the response.

Levitz (1971) exposed university students to an EGM variable ratio schedule that either produced a net win or a net loss over 22 trials. Both groups were then subjected to a net loss schedule. Participants with the prior exposure to the net win schedule persisted significantly longer in the second phase. In a laboratory simulation, Weatherly and Brandt (2004) found that percentage payback rate (75%, 83%, and 95%) did not influence EGM gambling behaviour over a 15 minute session.

Dickerson, Hinchy, England, Fabre, and Cunningham (1992) observed the natural play of 10 high frequency EGM gamblers and found that small wins (fewer than 50 credits) were associated with an increase in play rate, but big wins (more than 50 credits) caused a temporary decrease in play rates (termed ‘post-reinforcement pauses’). Similar results in similar naturalistic studies were reported by Dickerson (1993), as well as findings that the number of big wins during the session was strongly predictive of duration of the session. Delfabbro and Winefield (1999a), also using a naturalistic observational study, obtained the same findings concerning the effects of small versus big wins on play rates immediately following wins, but did not find they made a difference in overall rate of play. A post-reinforcement pause in laboratory EGM play following wins was also found by Schreiber and Dixon (2001) and Dixon and Schreiber (2002). In addition, the latter study found that the speed of play increased as the number of non-reinforced trials increased. In contrast to Dickerson (1993), Kassinove and Schare (2001) did not find that a ‘big’ win in a laboratory setting resulted in greater persistence to extinction, although they believed the size of the big win (\$10), may have been insufficient for the anticipated effect.

#### Game Play Speed

The permitted speed of play is also a reinforcement parameter, as it directly relates to frequency of rewards. Blaszczynski, Sharpe, and Walker (2001) (also reported in Sharpe, Walker,

Coughlan, Enersen, and Blaszczynski, 2005) found no significant difference in money or time spent between individuals who played EGMs with 3.5 second versus 5 second game speeds in a study conducted with 210 EGM players in clubs and hotels in New South Wales. This was attributed to the fact that only 12% of players normally played at a wager cycle faster than 5 seconds. Delfabbro, Falzon, and Ingram (2005) found that 3.5 second games *did* produce an increase in number of games played, but not total time spent playing. Results of a study conducted by Ladouceur and Sevigny (2006) indicated that 5 second game speeds caused gamblers to play significantly more games and spend more money compared to 15 second game speed EGMs. Similarly, a 30% reduction in game speed was reported to be an important factor in a 14% reduction in expenditure and time spent by gamblers (particularly higher risk gamblers) in a study of VLTs in Nova Scotia (Corporate Research Associates, 2006)<sup>9</sup>.

The recent introduction of auto-play EGMs (machines that play automatically on insertion of money followed by the press of an ‘AutoPlay’ button), is relevant to the issue of game speed play, but there has been no research on their impact. Nonetheless, the presumption of greater harm is reflected in the fact that they have been banned in Victoria, South Australia, and Western Australia (Caraniche Pty Ltd., 2005).

### Near Misses

Strickland and Grote (1967) found that placing frequent winning symbols early in the slot machine’s 3 symbol sequences increased persistence in laboratory slot machine play compared to when they were placed late in the sequence. Skaer (1985) similarly found that his subjects preferred to play the slot machine that was perceived to more frequently come close to paying off. More recently, both Kassinove and Schare (2001) and Cote, Caron, Aubert, Desrochers, and Ladouceur (2003) have confirmed that people who come close to a ‘near win’ persist significantly longer in subsequent laboratory EGM play. Wohl and Enzle (2003) found that wagers following a near loss were significantly higher in subsequent games of laboratory-based, computerized roulette play.<sup>10</sup>

### Number of Play Lines

In a series of observational studies, Williamson and Walker (2000) and Walker (2001) have found that gamblers have a preference for playing large number of lines (up to 20), with a minimum bet per line. This may be because of the increased rate of wins, size of wins, and near misses that occur with more lines. Consistent with these observations, in a laboratory investigation, Delfabbro, Falzon and Ingram (2005) found that a 3 line betting produced an increase in the number of games played and time spent compared to single line betting.

### Bill Acceptors

The adoption of bill or note acceptors on EGMs beginning in the late 1980s and early 1990s was generally associated with significant increases in EGM revenues and lower operating costs for the gaming venue. It is thought that the increased revenues associated with note acceptors may have disproportionately impacted problem gamblers, as note acceptors decrease the need to visit the cashier on a regular basis (which might act as a sort of social constraint) and they decrease the need for breaks

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<sup>9</sup> The actual time speeds used were not reported.

<sup>10</sup> A related phenomenon likely with the same effects is ‘nudging’, where an EGM reel appears to come to a halt with a winning sequence, and then a second or two later, nudges over to a different outcome.

(Productivity Commission, 1999). There is no formal research on this topic. Norway banned the use of bill acceptors on VLTs in July 2006 (G4 Newsletter, 2006).

Limiting the size of the note that can be accepted has not been very effective. Blaszczynski, Sharpe, and Walker (2001) (also reported in Sharpe et al., 2005) found that limiting EGM bill acceptors to \$20 AU maximum had no significant effect on time or money spent gambling (even though more problem gamblers than recreational gamblers used large note acceptors). They attributed this to the fact that all venues have facilities to change larger denominations to smaller notes. This same initiative was reported to be ineffective in a study of Queensland EGM players (Brodie, Honeyfield, & Whitehead, 2003), a significant portion of whom indicated the maximum note amount should be lower than \$20 (or eliminated altogether as has been legislated in Norway, South Australia, and within hotels and clubs in Tasmania and the Australian Northern Territory). (Note: in certain Australian jurisdictions it is possible to put up to \$10,000 into a machine at any one time).

### Bet Size

A policy to limit EGM bets to a maximum of \$10 was reviewed in the Australian Capital Territory (McMillen & Pitt, 2005). The policy did not result in behavioural change for either recreational or problem gamblers, as it was perceived as a higher limit than was usually bet. However, Blaszczynski et al. (2001) (also reported in Sharpe et al., 2005) found that reducing maximum bet from \$10 to \$1 resulted in significantly decreased EGM expenditures and time spent playing. Weatherly and Brandt (2004) found that students in a laboratory situation tended to bet more when they were staked with \$1 and each bet was worth \$0.01, compared to students who were staked with \$10 and each bet was worth \$0.10, suggesting that the perceived magnitude of bets and losses may affect duration of play. Delfabbro, Falzon, and Ingram (2005) found no influence of bet size (1 versus 3 credits) on time spent gambling or number of plays.

It is perhaps worth noting that the lower rates of problem gambling found in many European countries compared to North America and Australia is associated with significantly lower bet and win sizes on most European EGMs. For example, in 1998 the maximum bet in the U.K. was only £0.50, whereas it was \$10 in Australia, \$100 in Canada, and \$500 in the U.S.) (Caraniche Pty Ltd., 2005).

### Maximum Win

There has been no research on this issue for EGMs other than the above mentioned cross-country comparisons. This is expected to be an important parameter considering the increasing popularity of 'progressive' EGMs offering much larger jackpots, and the fact that lottery patronage increases significantly as a function of jackpot size (Kearney, 2002). In the United Kingdom, new regulations regarding gambling machine categories will be enacted in September 2007, whereby Class D 'amusement' machines with low stakes and low maximum prizes (10-30 pence and £5-8) will continue to be available to all citizens, including children (Department for Culture, Media and Sport, 2006). Problem gambling prevalence in the UK has historically been low, and low stake/prize machine gambling has long been accessible to children. It remains to be seen whether the coming liberalization of gambling laws (and the expected licensing of large, regional casinos offering unlimited stake/prize EGMs), will impact the prevalence of problem gambling.

### Interactive Features

The increasingly interactive nature of EGMs almost certainly promotes the illusion of control (Griffiths, 1993, 1994; Langer, 1975). However, there has been very little empirical research that

investigates the magnitude of this effect on EGM play. Loba, Stewart, Klein and Blackburn (2002) found that gamblers did not believe that the presence or absence of a 'stop reel' function (button) would alter gambling behaviour. However, in two studies that examined actual behaviour, the presence of this 'stop reel' function was found to significantly increase length of gambling sessions (Ladouceur & Sevigny, 2005) as well as money spent gambling (Corporate Research, 2006). In this latter study, higher risk gamblers were most influenced.

### Pop-Up Messages

Ladouceur and Sevigny (2003) investigated the effectiveness of two different pop-up messages on 30 EGM players. The study found a significant reduction in the number of bets made by players who saw a message about randomness as well as players who simply saw the word 'break' compared with a group not exposed to pop-up messages. They explained this outcome as interrupting cognitive processes that tended to facilitate narrowed attention and 'loss of reality'. Schellinck and Schrans (2002) found that an EGM pop-up message after 60-minutes of continuous play (and 30 minutes thereafter), telling players how long they had played and asking if they wished to continue, resulted in a small but significant reduction in session length and a decrease in expenditure among higher-risk players. Habituation to these messages was noted as a potential problem. In the second phase of this study, Schrans, Grace and Schellinck (2004) found that a pop-up message after every 30 minutes produced no significant improvement over the 60 minute message. Cloutier, Ladouceur, & Sevigny (2006) found that pop-up messages regarding erroneous beliefs produced a significant decrease in these erroneous beliefs at post-test. In contrast to these findings, pop-up reminders indicating how much time the person has played did not influence the amount of money spent gambling on VLTs in an Alberta study (Wynne & Stinchfield, 2004).

### Clock

Schellinck and Schrans (2002) found that an on-screen clock was associated with improvements in keeping track of time and playing within desired time limits, but had no effect in reducing session length or expenditure. An on-screen clock also had no effect on gambling behaviour in a study by Wynne and Stinchfield (2004).

### Mandatory Cash-Out

A recent naturalistic study of EGM play found a logarithmic distribution of time spent playing EGMs, with a median gambling duration of 13 minutes, an average of 24 minutes and a maximum of 525 minutes (Townshend & Stansfield, 2007). Only 10% of players play for one hour or more, which suggests that time limitations or mandatory cashouts may have some utility. However, the only formal research on this issue is a study by Schellinck and Schrans (2002) which found that mandatory cash out after 145 minutes did not alter EGM player behaviour. To date, shorter cash-out periods have not been investigated.

### Privacy

Video lottery terminal players reported that placing VLTs in isolated areas of bars and taverns likely contributed to impaired control in a study by Ladouceur, Jacque, Sevigny, and Cantinotti (2005). However, a laboratory test did not find these same people to gamble more in a more secluded setting. On the other hand, in a laboratory study by Lalumiere, Williams, and Morgan (2006) it was found that having someone directly observe their VLT play resulted in a very significant reduction in



the amount of time played among 180 male gamblers. The effect was equal for male and female observers, and for problem versus non-problem gamblers.

### Money versus Credits

Although it is believed that the use of credit and debit cards increases spending relative to actual cash, there is not much evidence on this topic with respect to EGMs. For example, money (versus credit) counters on VLTs were not found to influence gambling behaviour in a study by Wynne and Stinchfield (2004). In Canada, although all EGMs outside of casinos (i.e., 'VLTs') pay winnings via a credit slip rather than cash, there tends to be no difference in their revenue generation compared to cash-paying slot machines inside gambling venues (Canadian Gambling Digest, 2004). In the Australian Capital Territory, policies to restrict EGM *cash* payments to winnings less than \$1,000 simply caused gamblers to cash out their winnings (and then resume play) before the \$1,000 limit was reached (McMillen & Pitt, 2005).

### Time and Spending Limits/Smart Cards

Schrans, Grace and Schellinck (2004) found that a feature allowing players to set a time limit on their VLT play was only effective in influencing one of the six behaviours being targeted for improvement. In recent years, 'smart cards' have been introduced into a few jurisdictions (e.g., New South Wales) that permit EGM players to set time and or spending limits on cards that are then used to play designated EGMs. While gamblers and EGM venue operators tend to offer support for such cards (Independent Gambling Authority, 2005; Nisbet, 2005; Omnifacts Bristol Research, 2005, 2007), there is limited research on their effectiveness. Anecdotally, problems have been expressed about their effectiveness when non-card EGMs are also readily available (as is the case in New South Wales). There is also a concern that because of the significant amount initially put on the card (e.g., \$200 in NSW) gamblers may increase spending, either due to more money being readily available or because they require less embarrassing interactions with cashiers and other gambling venue staff (Nisbet, 2005). That being said, people who actually use the cards have some tendency to report that the card helped them manage their spending (Nisbet, 2005; Omnifacts Bristol Research, 2005, 2007).

Limited support for these cards is found in one of the few empirical studies. Focal Research (2007) tracked VLT play for a 6 month period in a region of Nova Scotia that only had player-card activated machines available (~51 EGMs in 9 locations played by 1,824 players). Roughly 71% of regular players (playing once a month or more) opted to try one of the responsible gaming (RG) features these cards permitted (i.e., 'spending limit', 'play limit', '2 day exclusion', or 'account summary' showing win/loss over various periods of time). Roughly 65% of these people continued to use one or more RG features in subsequent sessions. A subsample of these RG adopters (n = 122) had a baseline period of non-RG use that allowed for a pre-post comparison. These individuals were found to have a significant decrease in per session expenditure (\$47 to \$40), an increase in play length (82 min to 98 min), and no change in frequency of play per month (9.3 to 9.3). Examination of individuals with high risk characteristics found no decrease in expenditure for high frequency players (18+ times in 6 months), and a tendency toward decreased per session expenditure offset by a tendency toward increased frequency of play for people with CPGI scores of 5 or higher.

### Lights and Sounds

Although there is considerable speculation and observational commentary about the effects of lights and sounds on gambling behaviour (e.g., Griffiths, 1993), there is very little empirical research. There is some evidence that alterations are related to subjective enjoyment of gambling (e.g., Loba et

al., 2002). In one of the few empirical studies, Delfabbro, Falzon, and Ingram (2005) found that EGMs with 35% lower illumination significantly increased either the number of plays or time spent playing. However, the presence or absence of sound did not influence gambling behaviour. Further investigation is needed to determine whether such features have differential effect on problem gambler sub-types such as those posited by Nower and Blaszczynski and cited earlier. The emotionally vulnerable sub-type, for example, gambles to cope with negative affect and may be drawn to more calming environments and games, whereas the impulsive anti-social sub-type may seek the most stimulating alternatives.

### Summary of EGM Parameter Modifications

In summary, the above research on EGM features has identified several modifications that appear to have some potential to reduce harm. Such features include slower speed of play, eliminating early big wins (perhaps by decreasing maximum win size), reducing the frequency of near misses, reducing the number of betting lines available, reducing the interactive nature of EGMs, and presenting pop-up messages. There is conflicting or insufficient evidence on the importance of payback rates, maximum win size, limiting maximum bet size, more public placement of EGMs, bill acceptor limitations, time and spending limits, mandatory cash-outs, and ambient light and sound. No evidence exists as to the effectiveness of on screen clocks or monetary rather than credit displays.

There are two important caveats about this research. The first is that almost all of these studies have been conducted on people with prior EGM experience. The effectiveness of EGM parameter modifications as primary prevention tools is plausible, but less certain. Second, the magnitude of the effects tends to be small. The reality is that any automated device employing a variable ratio schedule (or more properly, random ratio schedule) with significant reinforcers and an event frequency of 5 seconds will tend to produce very strong behavioural patterns that are resistant to extinction (Ferster & Skinner, 1957).<sup>11</sup> Thus, EGMs will likely always be ‘high-risk’ devices with a strong association to problem gambling.

### Maximum Loss Limits

In addition to loss limits that are available on some EGMs, policies to limit the amount of money a gambler can lose are found on several of the major Internet gambling sites (e.g., [www.Betfair.com](http://www.Betfair.com), [www.888.com](http://www.888.com)). Limits are usually placed on maximum losses or deposits. However, similar problems to casino self-exclusion programs exist concerning the ability to revoke limits or having easy access to other sites where limits have not been placed.

It is rare to find maximum loss limit policies in land-based venues. One exception is the state of Missouri, which from 1994 has restricted each gambler’s losses to a maximum of \$500 during two hour ‘excursions’ on its eleven riverboat casinos (patrons can buy no more than \$500 in gambling

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<sup>11</sup> Indeed, there are many who would argue that operant conditioning is the main theoretical framework with which to understand EGM play (Delfabbro, Falzon, & Ingram, 2005; Delfabbro & Winefield, 1999a, 1999b; Dickerson, 1979; Dickerson, 1993; Dickerson, Cunningham, Legg-England, & Hinchy, 1991; Dickerson et al., 1992; Dixon & Schreiber, 2002; Knapp, 1976; Petry & Roll, 2001). However, while principles of learning (both operant and classical) are likely of fundamental importance, it is clear that they are insufficient on their own. While pigeons pecking keys for food under a variable ratio schedule will all develop very persistent behaviour, only a minority of people who ever play EGMs find them appealing and continue playing them. Secondly, the evolutionary purpose of operant conditioning is to shape behaviour so as to optimize returns. Excessive EGM play (i.e., problem gambling) is not an adaptive response to the environmental contingencies these machines offer.

chips for the slot machines and table games). There is no information on the effectiveness of this measure other than the Missouri casino industry repeatedly pointing out that their revenues are much smaller than competing riverboat casinos in neighbouring jurisdictions (Brokopp, 2006). Here again, there are logistical problems involved with applying this policy to more than one venue at a time.

### Restricting Access to Money

In Canada, the granting of house credit is banned in all jurisdictions except in Ontario's commercial, resort-style casinos. Automatic/automated teller machines (ATMs) are commonly located in casinos and EGM gambling venues throughout Canada (either on or off the gambling floor). Venue-imposed ATM withdrawal limits do not appear to exist, and both debit and credit transactions are generally allowed. Manitoba is unique in banning debit card use for VLT gambling. Also in that province, cheque-cashing and credit card use are not allowed in casinos.

House credit is common practice in U.S. gambling venues, especially casinos. Cheque-cashing is considered to be a form of house-credit, and is the only form allowed in some states. ATMs are located in gambling venues, and limits on ATM withdrawal amounts do not appear to be in place. However, in a move to curb Internet gambling, on July 11, 2006, the U.S. House of Representatives passed legislation to prevent gamblers from using credit cards to bet online on sports betting and casino games; online lottery and horserace betting would still be allowed ("U.S. moving", 2006).

In Europe, house credit is banned. ATMs appear to be generally available at gambling venues, but information regarding withdrawal limit policies was not found in a search of electronically available information. Credit card use at ATMs appears to be allowed.

The Republic of South Africa (2004) does not allow credit to be provided in gambling venues, and prohibits the placing of cash dispensing machines/automated teller machines in gambling venues as follows: "No person may place or operate a cash dispensing machine contrary to this Act—(a) within a designated area; or (b) within a prescribed distance from such a designated area" (p. 30).

In New Zealand, credit card use to a limit of \$200 per day is allowed. There appear to be no limits on ATM withdrawals, and regulations require that ATMs be located away from gambling areas within gambling venues.

Credit is banned in Australian states and territories, with the exception of South Australia. In that state, credit is allowed for non-machine gambling. ATMs and EFTPOS (Electronic Funds Transfer at Point of Sale) facilities are available at almost all gambling venues throughout Australia, generally located away from the gambling floor. In South Australia, ATM withdrawals are limited to \$200 a day, but can be increased on formal application. In the Australian Capital Territory, there are no daily withdrawal limits for gambling purposes, and credit transactions on ATMs are allowed. ATM withdrawals in Queensland are limited to \$100 per day. The state of Victoria limits transactions at ATM and EFTPOS facilities to \$200 per use, and credit card withdrawals are not allowed. In certain Australian states, winnings in excess of certain amounts are paid by cheque, and certain jurisdictions do not permit the venue to cash these cheques (Caraniche Pty Ltd., 2005).

There is a lack of empirical research concerning the effectiveness of monetary restrictions. However, existing anecdotal and survey data indicate that restricting ready access to cash is a potentially effective strategy. First, it is well established that problem gamblers access cash machines more frequently than regular gamblers (Caraniche Pty Ltd., 2005; Independent Pricing and Regulatory Tribunal, 2004). Second, problem gamblers in treatment report that the most common reason for

terminating a gambling session and leaving a gambling venue is because they have run out of money (Productivity Commission, 1999). Indeed, self-reports of problem gamblers consistently identify easy and immediate access to cash as exacerbating gambling-related harm (e.g., Caraniche Pty Ltd., 2005; McMillen, Marshall, & Murphy, 2004; SACES, 2005). The majority of 418 EGM players in Victoria, Australia were of the view that ATMs should not be located in gambling venues at all. Among this same group, this measure was deemed to be the most effective harm minimization strategy available (Caraniche Pty Ltd., 2005).

Implementation of policies to ban credit, limit ATM withdrawals, or remove ATMs from or near gambling venues is often opposed by the gambling industry as well as some gambling researchers, due to the potential inconvenience it would impose on non-problem gamblers (McMillen et al., 2004). While this may be true, it must be said that several problem gambling prevention policies have the same potential. And it is certainly fairly common practice for policies governing the provision or use of problematic products (e.g., alcohol, tobacco, firearms) to restrict unfettered use by at-risk *and* non at-risk individuals so as to benefit society as a whole.

### Restrictions on Concurrent use of Alcohol and Tobacco

Gambling and drinking often co-occur, particularly where gambling occurs at problematic levels (e.g., Crockford & el-Guebaly, 1998; Giacomassi, Stitt, & Vandiver, 1998; Grant, Kushner, & Kim, 2002). The link between increased drinking and increased gambling has also been demonstrated. A study on consumption of alcohol during VLT play found that length of play, rate of double-up betting, and play of losing hands increased during moderate alcohol intoxication, especially for probable pathological gamblers (Ellery, Stewart & Loba, 2005). Kyngdon and Dickerson (1999) found that alcohol consumption prolonged gambling sessions, with the potential for greater financial loss associated with increased risk taking. Other research replicates the finding that alcohol has a disinhibiting effect on gambling in terms of taking increased risks (Baron & Dickerson, 1999; McDonnell-Phillips Pty Ltd, 2006; Phillips, Triggs, Coman, & Ogeil, 2005). Given this knowledge, restrictions on the use of alcohol while gambling have significant potential as a harm minimization strategy for problem gambling.

While policies regarding the sale of alcohol in gambling venues vary worldwide, responsible service practices (e.g., prohibiting continued sale of alcohol to intoxicated gamblers) are generally either legislated or otherwise entrenched in government policy. Policies concerning free drinks and other complementary goods and services are less likely to be included in responsible gambling codes. Following is a brief review of alcohol-related policies in various gambling jurisdictions.

Casinos in Canada may provide free goods and services, but free alcoholic beverages are not allowed. Alcohol service is prohibited in some British Columbia casinos, where municipal governments assume responsibility for such licensing decisions. In the United States, free drinks are provided to casino patrons in 6 of 11 states with commercial casinos (Colorado, Iowa, Louisiana, Nevada, Mississippi, and New Jersey). Low-cost drinks are also common. The Oneida Nations Turning Stone Resort and Casino near Syracuse, New York, bans the service of alcohol entirely. Free drinks and discounted alcoholic beverages are either banned or not commonly available in most European countries, except in some Eastern European countries (e.g., casinos in the Ukraine). Some casinos in Australia (e.g., Casino Canberra; Crown Casino, Victoria) provide low-cost or free drinks for customers. ‘Host Responsibility’ regulations in New Zealand prohibit free drinks, and include responsible practices for the serving of alcohol.

Just as gambling and alcohol consumption are related, the association between gambling and tobacco use has been established. Public health campaigns have successfully led to implementation of ‘public place’ smoking bans in growing numbers of jurisdictions around the world in order to reduce the well-known health risks associated with smoking and second-hand smoke. In Canada, smoking is banned province-wide (with the exception of First Nations reserves), in Ontario, Quebec, Saskatchewan, Manitoba, and New Brunswick. The Government of Alberta has given to municipalities the responsibility to implement bans if desired. Tasmania is the only region of Australia with a current total ban, but several other states and territories intend to implement such bans within the next few years. Growing numbers of states in the USA are smoke-free, and Montana intends to become so as of October 2009 (except for Native casinos). New Jersey implemented a smoking ban this year that exempts all casinos. England will implement a smoking ban in the summer of 2007.

Smoking bans may inadvertently act as one of the more effective policies to reduce problem gambling, given that the majority of problem gamblers are smokers (e.g., Petry, Stinson, & Grant, 2005; Rodda, Brown, & Philips, 2004). It is no coincidence that gambling venues are the most common places to petition for and receive exemptions from public smoking bans. Indeed, significant reductions in gambling revenues have followed gambling venue smoking bans in various jurisdictions, including Canada, Australia and New Zealand (Atlantic Lottery Corporation, 2006; Hospitality Association of New Zealand, 2005; Pakko, 2005; Saskatchewan Liquor and Gaming Authority, 2006; Skycity Entertainment Group, 2005). This is notable considering that a large proportion of gambling revenue traditionally has derived from problem gamblers (Williams & Wood, 2004a, 2004b, in press). It is hypothesized that problem gamblers may be less likely to gamble for extended periods if they cannot smoke, thereby introducing a mechanism for reducing harm. Among a group of 418 EGM players in Victoria (49% of whom smoked, with significantly higher rates among problem gamblers), 67% regarded the restriction of smoking in gambling areas to be an effective gambling harm minimization strategy (Caraniche Pty Ltd., 2005). Forty-nine percent of the smokers reported that they spent less time playing EGMs, and 5% reported they spent more time. This is corroborated by a survey of EGM venue operators, who reported that among all the harm minimization measures, the smoking ban was the most effective (Caraniche Pty Ltd., 2005). In New Zealand, a 15.8% drop was seen in the number of government-funded problem gambling service users after the first year of the smoking ban (Ministry of Health, 2006).

Interestingly, there is also evidence that EGM and casino revenues may return to their previous levels after some time (e.g., Buchanan, 2006, p. 13, citing Tattersall’s 2005 Annual Report: “Gaming revenue returned to full-year growth following the downturn after the introduction of smoking bans in Victorian gaming venues in 2002”). There is no empirical research to indicate whether this is due to a) smokers (and problem gamblers) having adjusted to this requirement, or b) non-smokers patronizing gambling venues at higher rates because of the smoke-free environment.

### Restricting Advertising and Promotional Activities

Policies to restrict gambling advertising and promotional activities are based on the belief that these activities may induce gambling in vulnerable groups (e.g., problem gamblers, minors), or may serve to counter-act advertising that promotes responsible or low risk gambling. There is some support for these contentions. In one study, half of a sample of pathological gamblers reported that advertising triggered them to gamble (Grant & Kim, 2001). Also, the amount of money devoted to gambling advertising is many magnitudes greater than the amount of money devoted to problem gambling prevention. For example, the province of Ontario is reputed to spend more money on prevention, treatment, and research than any other jurisdiction in the world, amounting to \$36 million in 2003/2004 (Sadinsky, 2005). By comparison, the Ontario Lottery and Gaming Corporation’s budget

for marketing, advertising, and promotions is over \$570 million, not including the additional advertising budgets of the three commercial casinos. Whereas previously reviewed research indicates that most people are unaware of ‘responsible gambling’ initiatives (Turner et al., 2005), it is the rare person who is unaware of the omnipresent lottery and casino advertisements on television and radio and along public roadways.

With respect to alcohol and tobacco, earlier research tended to indicate that advertising influenced market share, but did not influence overall consumption (Boddewyn, 1994; Fisher, 1993; Smart, 1988). However, more recent research has found a much stronger relationship between exposure to tobacco or alcohol advertising and subsequent use of these substances in youth (Ellickson, Collins, Hambarsoomians, & McCaffrey, 2005; Lovato, Linn, Stead, & Best, 2006). Furthermore, Weiss et al. (2006) found that anti-tobacco advertising is typically insufficient to counteract the effects of pro-tobacco advertising.

Prohibiting misleading advertising is as important as restricting the amount of advertising. Typical examples are lottery advertisements that suggest the chances of winning are better than they actually are, and that a person’s overall wellbeing will be substantially better after winning a jackpot (e.g., Korn, Hurson, and Reynolds, 2005). Similarly, websites that provide players with information about the frequencies of winning lottery numbers deceptively convey the impression that useful information might be gleaned from this data.

### Gambling Venue Design

Many casinos around the world employ a ‘Vegas-style’ design. The essential elements of this design are a lack of windows, an absence of clocks, a maze-like interior, low ambient light punctuated by the bright colorful lights of EGMs, and the constant background noise of EGMs, particularly the sounds of winning (there is no sound of losing). The presumption is that all of these elements help induce and perpetuate gambling. However, here again, there is a lack of empirical evidence on the issue.

Subjectively, many gamblers believe that design characteristics do promote different patterns of play (e.g., Finlay, Marmurek, Kanetkar, and Londerville, 2007), and that alteration of these features would be useful harm minimization strategies (Caraniche Pty Ltd., 2005; Hing, 2003). Some researchers have also demonstrated that the light and sound characteristics of EGMs are arousing and attractive features to gamblers (Griffiths, 1993; Griffiths & Parke, 2005). Delfabbro, Falzon, and Ingram (2005) empirically demonstrated that EGMs with lower illumination significantly increased time spent playing (sound did not influence gambling behaviour). There is also some tentative evidence that people gamble more under red lighting (Griffiths & Swift, 1992; Stark, Saunders, & Wookey, 1982).

However, even if it was well established that these elements promoted gambling behaviour among current gamblers, a plausible mechanism might be their conditioned association to the gambling itself (lights and sounds being very salient, easily conditionable stimuli). The other observation relevant to this issue is that EGMs have no difficulty generating significant revenues in all sorts of different environments, including convenience stores, bars, clubs, hotels, arcades, restaurants, racetracks, and boats.

## Increasing the Cost of Gambling

This is mentioned as a strategy because of the effectiveness of increasing the cost of alcohol and tobacco (through taxation) as a policy for helping to prevent alcohol and tobacco use and abuse (e.g., Babor et al., 2003; Cnossen, 2005). However, it is unclear whether increasing the cost of legal gambling would effectively deter problem gambling (Clotfelter, 2005). Substantial economic ‘costs’ are already built into gambling products. Furthermore, the current payback rate or cost of a gambling product tends to have little relationship to its use (i.e., highest patronage for lotteries, which offer the lowest payback rate; relatively low patronage of casino table games with higher payback rates). That being said, there is evidence that variation of payback rates within a particular gambling format (e.g., roulette, sports betting), does influence spending on that format (i.e., lower spending with lower payback rates) (Harvey, Swayze, Walls, 2004; Paton, Siegel, Vaughan-Williams, 2004).

## Independence Between Gambling Regulators and Providers

The traditional role of government has been to regulate problematic products/services. However, in many jurisdictions governments have expanded their role to include the actual provision of gambling. In some instances this is limited to state-operated lotteries, and in other instances (e.g., Canada) governments are the major provider of EGMs, casinos, sports betting and other forms of gambling. A conflict of interest exists when the regulator and operator are part of the same organization. The relevance with respect to the prevention of problem gambling is that this conflict of interest potentially compromises the regulator’s ability to implement truly effective prevention policies, and to effectively regulate the operator.<sup>12</sup> Effective prevention and treatment will typically negatively impact revenues, introducing a policy conflict between the protection of public health and the maximization of gambling revenues. It seems fairly evident that total independence between the regulator and the provider is a policy more conducive to the prevention of problem gambling.

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<sup>12</sup> This lack of independence (or perception thereof) is reinforced by appointments that are made. For example, in Ontario, Canada, the head of the regulatory body (Brown; with the Alcohol and Gaming Commission) was subsequently appointed the head of the operating body (Ontario Lottery & Gaming Corporation). The head of the operating body (Sadinsky), was subsequently appointed as an ‘independent reviewer’ of Ontario’s responsible gambling initiatives (wherein OLG plays a large part).

## SUMMARY AND RECOMMENDATIONS

Table 2 summarizes the evidence concerning the effectiveness of various educational and policy initiatives to prevent problem gambling. This table makes several important points. First, *there exists a very large array of prevention initiatives*, many of which have been implemented in various jurisdictions. This reflects the considerable interest and effort that is being put into mitigating the harm caused by gambling in recent years

Second, *much is still unknown about the effectiveness of many individual initiatives*. There is not a single initiative where the evidence is conclusive. In most cases the evidence is fairly limited and estimations of effectiveness are tentative. There is a particular lack of well conceived and well designed educational initiatives that show efficacy. Considerably more research is warranted. *In conducting this research it is important to focus on meaningful behavioural change as the measure of effectiveness*. Improvements in awareness, knowledge or attitudes are of value as intermediate steps in the right direction, but of very limited importance if not accompanied by behavioural change (Simpson et al., 2006). Similarly, the perceptions or opinions of at-risk gamblers toward a particular prevention policy is useful information, but is never a substitute for actual changes in behaviour. Because prevention initiatives are rarely implemented in isolation, annual or regular periodic evaluations of population prevalence and incidence are a good way of monitoring the overall impact of these efforts, and would comprise a very minor expense in relation to the magnitude of gambling revenues. *Furthermore, developing these initiatives in the context of a theoretical model of behavioural change* (e.g., Health Beliefs Model; Janz et al., 2002) *will improve the likelihood of a successful outcome*. Most of these initiatives lack explicit theoretical underpinnings that help explain why the behavioural effect would be expected.

Third, *the most commonly implemented prevention measures tend to be among the least effective options* (e.g., awareness/information campaigns, responsible gambling features on EGMs, casino self-exclusion, etc.). *Furthermore, when potentially more effective initiatives are implemented, they are typically done in such an inconsequential or perfunctory fashion as to virtually ensure lack of impact* (e.g., small reductions in number of gambling venues or numbers of EGMs, minor restrictions on access to money, etc.). This is partly because the selection and design of most preventive initiatives is not done by social scientists with expertise in prevention, but typically by government or industry employees with backgrounds in business, economics, law, etc.<sup>13</sup> These are also usually individuals with more of a commercial than public health orientation, who try to implement preventive measures that do not cause inconvenience to non-problem gamblers and/or adversely impact revenues. However, this latter goal is difficult if not impossible to achieve, considering that problem gamblers account for a substantial portion of overall gambling revenue (Productivity Commission, 1999; Williams & Wood, 2004a, 2004b, in press). *There needs to be acceptance of the fact that effective problem gambling prevention will likely only occur with some inconvenience to non-problem gamblers and a decrease in gambling revenues*. The reality is that all societies have policies/laws that ‘infringe’ on unfettered individual freedoms (e.g., ownership of automatic weapons, highway speed limits, etc.) even though these policies are likely only necessary for a small percentage of vulnerable or high-risk individuals. Similarly, it is not uncommon for governments to implement socially responsible policies that adversely affect their revenues (e.g., current restrictions on tobacco advertising and consumption). These are the sort of limitations that citizens routinely accept, and initiatives that governments routinely make, to produce a healthier society overall.

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<sup>13</sup> As Blaszczynski, Ladouceur and Shaffer (2004) state: “most public policy recommendations are not based on empirical data but derive instead from anecdotes, common sense, and personal belief” (p. 306).



Table 2. Estimated Effectiveness Potential of Problem Gambling Prevention Initiatives.

	high	moderately high	moderate	moderately low	low
EDUCATIONAL INITIATIVES			✓		
‘Upstream’ Interventions		✓			
Information/Awareness campaigns				✓	
More Sustained and Directed Educational Initiatives			?		
Statistical Instruction				✓	
Comprehensive Programs			?		
On-Site Information/Counselling Centres (RGIC)			?		
POLICY INITIATIVES			✓		
Restrictions on the General Availability of Gambling		✓ <sup>1</sup>			
Restricting the Number of Gambling Venues (casinos/racinos)		✓ <sup>1</sup>			
Restricting More Harmful Types of Gambling		✓ <sup>1</sup>			
Limiting Gambling Opportunities to Gambling Venues			?		
Restricting the Location of Gambling Venues		✓			
Limiting Gambling Venue Hours of Operation				? <sup>2</sup>	
Restrictions on Who can Gamble			?		
Prohibition of Youth Gambling				? <sup>3</sup>	
Restricting Venue Entry to Non-Residents		? <sup>4</sup>			
Restricting Venue Entry to Higher Socioeconomic Classes				?	
Casino Self-Exclusion				✓ <sup>5</sup>	
Restrictions on How Gambling is Provided			?		
Problem Gambling Training for Employees of Gambling Venues				?	
Automated Intervention for At-Risk Gamblers			✓		
Modifying EGM Parameters				✓ <sup>6</sup>	
Maximum Loss Limits				?	
Restricting Access to Money			?		
Restrictions on Concurrent use of Alcohol and Tobacco		✓			
Restricting Advertising and Promotional Activities				?	
Gambling Venue Design					?
Increasing the Cost of Gambling				?	
Independence Between Gambling Regulator and Gambling Provider			?		

1. If the reductions are substantial
2. Unless the time reduction is very substantial.
3. Likely has higher potential for preventing youth problem gambling.
4. Prevention benefits limited to residents rather than non-residents.
5. If done appropriately.
6. Primarily slower speed of play, eliminating early big wins (perhaps by decreasing maximum win size), reducing frequency of near misses, reducing number of betting lines, reducing interactive features, elimination of bill acceptors, and presentation of pop-up messages.

Note. Question mark indicates uncertainty due to insufficient evidence.

Fourth, Table 2 suggests that while certain initiatives are more effective than others, *there is almost nothing that is not helpful to some extent and, conversely, there is almost nothing that, by itself, has huge potential to prevent harm*. There is no ‘magic bullet’ to prevent problem gambling. Even total prohibition would likely only have a moderately positive impact, with some offsetting negative consequences. Similarly, even the less effective initiatives may change the behaviour of a few individuals, lay the foundations for later behaviour change, or may contribute to the effectiveness of other initiatives.<sup>14</sup> Furthermore, the present review makes the case that *external controls (policy) can be just as useful as internal knowledge (education)*. Within the gambling field, sentiments are sometimes expressed that external controls are inferior strategies (e.g., Napolitano, 2003), or that the primary emphasis should be placed on educating gamblers so they can make ‘informed choices’ (e.g., Blaszczynski et al., 2004; Blaszczynski et al., 2005). Strong counterpoint can be found within the substance abuse field, however, where research shows that a) mandated treatment is generally as effective as voluntary treatment (Miller & Flaherty, 2002; Wild, Roberts, & Cooper, 2002), and b) contingency management approaches tend to be more effective than counselling (Prendergast, Podus, Finney, Greenwell, & Roll, 2006). No one argues that policy measures in the form of laws concerning bicycle helmets, fencing around swimming pools, speed limits, and maximum blood alcohol levels while driving, etc. are not helpful in preventing undesirable outcomes. The same logic applies to gambling policy.

The corollary of this last point is that *effective prevention in most fields actually requires coordinated, extensive and enduring efforts between effective educational initiatives and effective policy initiatives aimed at the same outcomes* (Nation et al., 1993; Stockwell, Gruenewald, Toumbourou, & Loxley, 2005). The biopsychosocial model makes it clear that problem gambling develops through a complex interaction between many different endogenous attributes and exogenous stimuli. Hence, effective prevention of alcohol abuse, for example, has required extensive and pervasive educational and policy initiatives directed at the individual, group and community level (CAMH, 1999; Foxcroft et al., 2005; Holder, 2005; Slater et al., 2005; Winters et al., 2007). Multiple prongs are often synergistic, with overlapping initiatives reinforcing the message and power of each other. Arguably, the need for comprehensive educational and policy efforts is even greater for problem gambling, as the age of onset tends to be broad in range, not circumscribed to early adolescence as is the commonly seen in substance abuse.<sup>15</sup>

The final point to be made is that *prevention efforts have to be sustained and long-lasting, because population-wide behavioural change takes a long time*. As indicated earlier, even where comprehensive approaches have been applied in other fields, the immediate effects on behaviour have sometimes been small (Merzel & D’Afflitti, 2003; Sowden & Stead, 2005; Wandersman & Florin, 2003) or absent (Gates et al., 2005; Secker-Walker, et al., 2002). Tobacco use best illustrates this point. There was no dramatic reduction in tobacco use after prevention efforts began in the mid 1960s. Rather, a very slow but progressive decline has been seen over the past 40 years as educational efforts, policies, and public attitudes have coalesced and strengthened.

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<sup>14</sup> The only caveat to this ‘everything is helpful’ notion concerns situations where the presence of weak initiatives is deemed sufficient, thereby impeding the adoption of more effective ones.

<sup>15</sup> This broad range of age onset for problem gambling will likely narrow with increased time and continued exposure to gambling opportunities.

These things appear to be mobilizing more quickly with gambling, so there is some possibility that reductions in problem gambling may occur more quickly.

## REFERENCES

- Abbott, M., Williams, M., & Volberg, R. (1999). *Seven years on: A follow-up study of frequent and problem gamblers living in the community*. Wellington, New Zealand: Department of Internal Affairs.
- Addictions Foundation of Manitoba (2004). *AFM 2003-2004 Annual Report*. Retrieved August 12, 2006, from <http://www.afm.mb.ca/About%20AFM/AnRpt0304.pdf>
- Addictions Foundation of Manitoba. (2005). *AFM 2004-2005 annual report*. Retrieved August 12, 2006, from <http://www.afm.mb.ca/About%20AFM/AFMAnRp04-05.pdf>
- Alberta Alcohol and Drug Abuse Commission (AADAC). (2001). *Problem gambling: Information and services summary*. Edmonton, Alberta: Author.
- Ajdacic-Gross, V., Killias, M., Hepp, U., Gadola, E., Bopp, M., Lauber, C., et al. (2006). Changing times: A longitudinal analysis of international firearm suicide data. *American Journal of Public Health, 96*(10), 1752-1755.
- American Gaming Association. (2006). *Industry information: States with slots*. Retrieved August 30, 2006, from [http://www.americangaming.org/Industry/factsheets/general\\_info\\_detail.cfv?id=32](http://www.americangaming.org/Industry/factsheets/general_info_detail.cfv?id=32)
- Atkin, C.K. (1995). Survey and experimental research on effects of alcohol advertising. In Martin, S.E. (Ed.), *The effects of the mass media on the use and abuse of alcohol* (pp. 39-68). NIAAA Research Monograph No. 28, NIH Publication No. 95-3743, Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.
- Atlantic Lottery Corporation. (2006). *Relevant, ready, responsible and regulated: 2005-06 annual report and social responsibility review*. Retrieved September 29, 2006, from <http://www.alc.ca/English/WhatsNew/Articles/1175/Content/ALCAnnualReport2005-06.pdf>
- Auckland University of Technology. (2005). *Literature review to inform social marketing objectives and approaches, and behaviour change indicators, to prevent and minimise gambling harm*. Final Report prepared by the Gambling Research Centre for the Health Sponsorship Council, Wellington, New Zealand. November 2005. Retrieved August 15, 2006, from <http://www.hsc.org.nz/pdfs/LitReview-ExecSummary.pdf>
- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., & Graham, K. (2003). *Alcohol: No ordinary commodity: Research and public policy*. New York: Oxford University Press.
- Back, K-J. (2006). *The Korean casino impact study*. Presentation to the Alberta Gaming Research Institute 5<sup>th</sup> Annual Conference: Social & Economic Costs and Benefits of Gambling, April 20, 2006. Banff, Alberta.

- Baron, E., & Dickerson, M.G. (1999). Alcohol consumption and self-control of gambling behaviour. *Journal of Gambling Studies*, 15, 3-15.
- Bell, L. (2004). *Using performance to engage youth*. Paper presented at Symposium 2004. Available at <http://www.responsiblegambling.org>.
- Benassi, V.A., & Knoth, R.L. (1993) The intractable conjunction fallacy: Statistical sophistication, instructional set, and training. *Journal of Social Behavior & Personality*, 8, 83-96.
- Bes, R. (2002). *Ten years of responsible gambling policy at Holland Casino: A study into the effectiveness of the Dutch casino RGP*. Paper presented to the Responsible Gambling Council of Ontario's Discovery 2002 Conference, April 2002. Niagara Falls, Canada.
- Blaszczynski, A., Ladouceur, R., & Shaffer, H. J. (2004). A science-based framework for responsible gambling: The Reno model. *Journal of Gambling Studies*, 20(3), 301-317.
- Blaszczynski, A., Ladouceur, R., Nower, L., & Shaffer, H. J. (2005). *Informed choice and Gambling: Principles for consumer protection*. Report prepared for the Australian Gaming Council, November 2005.
- Blaszczynski, A., & Nower, L. (2002). A pathways model of problem and pathological gambling. *Addiction*, 97(5), 487-499.
- Blaszczynski, A., Sharpe, L., & Walker, M. (2001). *Final report: The assessment of the impact of the reconfiguration on electronic gaming machines as harm minimisation strategies for problem gambling*. Retrieved August 10, 2006, from [http://www.psych.usyd.edu.au/gambling/GIO\\_report.pdf](http://www.psych.usyd.edu.au/gambling/GIO_report.pdf)
- Blue Thorn Research, Population Health Promotion Associates, & Williams, R.J. (2007). *Socioeconomic Impacts of New Gaming Venues in Four British Columbia Lower Mainland Communities: Final Report*. Submitted to the Gaming Policy and Enforcement Branch, Ministry of Public Safety & Solicitor General, Government of British Columbia. May 2007.
- Boddewyn, J.J. (1994). Cigarette advertising bans and smoking: The flawed policy connection. *International Journal of Advertising*, 13, 311-332.
- Bridwell, R. R., & Quinn, F. L. (2002). From mad joy to misfortune: The merger of law and politics in the world of gambling. *Mississippi Law Journal*, 72(2), 565-729.
- Brodie, M., Honeyfield, N., & Whitehead, G. (2003). *Change in bank note acceptors on electronic gaming machines in Queensland – Outcome evaluation*. Retrieved July 27, 2006, from [http://rgco.org/articles/change\\_in\\_bank\\_note\\_acceptors\\_on\\_electronic\\_2003.pdf](http://rgco.org/articles/change_in_bank_note_acceptors_on_electronic_2003.pdf)

- Brokopp, J. G. (2006). *Missouri stands alone with limit on losses* (reprinted from the Chicago Sun Times, September 8). Available at <http://www.responsiblegambling.org>
- Buchanan, J. (2006). *The impact of new gaming laws on the profitability and management of gaming establishments in New South Wales (NSW), Australia*. Retrieved September 10, 2006, from [http://www.unr.edu/gaming/13th\\_Conference\\_Web\\_files/Files/Abstracts/Gaming%20Regulation%20and%20Deregulation/June%20Buchanan.DOC](http://www.unr.edu/gaming/13th_Conference_Web_files/Files/Abstracts/Gaming%20Regulation%20and%20Deregulation/June%20Buchanan.DOC)
- Byrne, A. M., Dickson, L., Derevensky, J. L., Gupta, R., & Lussier, I. (2005). The application of youth substance use media campaigns to problem gambling: A critical evaluation. *Journal of Health Communication, 10*(8), 681-700.
- Centre for Addiction and Mental Health (CAMH). (1999). *Alcohol and drug prevention programs for youth: What works?* Best Advice Paper, Centre for Addiction and Mental Health. Toronto: Author.
- Canadian Broadcasting Corporation. (2006, August 14). *Casino counsellors help addicts at the source*. Available at <http://www.responsiblegambling.org>
- Canadian Broadcasting Corporation. (2007, June 1). *Gambler's self-ban system built on quicksand*. Available at <http://www.cbc.ca/consumer/story/2007/06/01/olg-gambling-agreement.html>
- Canadian Partnership for Responsible Gambling. (2004). *Canadian gambling digest*. Retrieved September 22, 2005, from [http://www.cprg.ca/articles/canadian\\_gambling\\_digest\\_2004.pdf](http://www.cprg.ca/articles/canadian_gambling_digest_2004.pdf)
- Caraniche Pty Ltd. (2005). *Evaluation of electronic gaming machine harm minimisation measures in Victoria*. Final Report prepared for the former Victorian Gambling Research Panel, December 2005. Retrieved July 28, 2006, from [http://www.justice.vic.gov.au/wps/wcm/connect/DOJ+Internet/Home/Gambling+and+Racing/Research+and+Statistics/JUSTICE+-+Evaluation+of+Electronic+Gaming+Machine+Harm+Minimisation+Measures+in+Victoria+\(PDF\)](http://www.justice.vic.gov.au/wps/wcm/connect/DOJ+Internet/Home/Gambling+and+Racing/Research+and+Statistics/JUSTICE+-+Evaluation+of+Electronic+Gaming+Machine+Harm+Minimisation+Measures+in+Victoria+(PDF))
- Carr, R. D., Buchkoski, J. E., Kofoed, L., & Morgan, T. J. (1996). "Video lottery" and treatment for pathological gambling: A natural experiment in South Dakota. *South Dakota Journal of Medicine, 49*(1), 30-32.
- Centre for Gambling Research (2005). *Review of the ACT Government's harm minimisation measures*. Prepared by the Australian National University's Centre for Gambling Research for the ACT Gambling and Racing Commission. March 2005. Retrieved July 5, 2006, from <http://gambling.anu.edu.au/menu/PDFs/Policy%20Review-Final-withISBN.pdf>

- Chapman, S., & Lupton, D. (1994). *The fight for public health: Principles and practice of media advocacy*. London: BMJ Books.
- Chipman, M., Govoni, R., & Roerecke, M. (2006). *The Distribution of Consumption Model: An Evaluation of its Applicability to Gambling Behaviour*. Final Report Prepared for the Ontario Problem Gambling Research Centre. March 2006.  
<http://www.gamblingresearch.org/download.sz/2305%20Final%20Report%20Posted%20Version.pdf?docid=8201>
- Chikritzhs, T., & Stockwell, T. (2006). The impact of later trading hours for hotels on levels of impaired driver road crashes and driver breath alcohol levels. *Addiction, 101*(9), 1254-1264.
- Clotfelter, C.T. (2005). Gambling taxes. In S. Cnossen (Ed.), *Theory and practice of excise Taxation: Smoking, drinking, gambling, polluting, and driving*. (pp. 84-119). Oxford: Oxford University Press.
- Cloutier, M., Ladouceur, R., & Sevigny, S. (2006). Responsible gambling tools: Pop-up messages and pauses on video lottery terminals. *The Journal of Psychology, 140* (5), 434-438.
- CNN.com (2007). Aborigines banned from booze, porn. June 21, 2007.  
<http://edition.cnn.com/2007/WORLD/asiapcf/06/21/australia.pornography.ap/index.html>.
- Cnossen, S. (2005). *Theory and practice of excise taxation: Smoking, drinking, gambling, polluting, and driving*. Oxford: Oxford University Press.
- Cook, P.J., & Moore, M.J. (2002). The economics of alcohol abuse and alcohol-control policies. *Health Affairs, 21*(2), 120-133.
- Corporate Research Associates. (2006). *Nova Scotia video lottery program changes: Impact analysis*. Available at <http://www.gamingcorp.ns.ca>
- Cote, D., Caron, A., Aubert, J., Desrochers, V., & Ladouceur, R. (2003). Near wins prolong gambling on a video lottery terminal. *Journal of Gambling Studies, 19*, 433-438.
- Crockford, D. N., & el-Guebaly, N. (1998). Psychiatric comorbidity in pathological gambling: a critical review. *Canadian Journal of Psychiatry, 43*, 43-50.
- Crown Casino. (2006). *Crown entertainment complex*. Retrieved August 4, 2006, from [http://www.crowncasino.com.au/assets/contentFiles/378/StudentInfo\\_CrownEntComplex.pdf](http://www.crowncasino.com.au/assets/contentFiles/378/StudentInfo_CrownEntComplex.pdf)
- Dangerfield, L. (2004). *Job satisfaction, substance use and gambling behaviour of northern Albertan casino employees*. Unpublished M.Sc. Thesis. University of Lethbridge, Lethbridge, Alberta.

- Davis, R.M. (2003). Prevention of problem gambling: A school-based intervention. *Dissertation Abstracts, MA1 42/05*, p. 1875, Oct 2004.
- De Bruin, D.E., Leenders, F.R.J., Fris, M., Verbraeck, H.T., Braam, R.V., & van de Wijngaart, G.F. (2001). *Visitors of Holland Casino: Effectiveness of the policy for the prevention of problem gambling*. CVO University of Utrecht, the Netherlands: Addictions Research Institute. Retrieved July 22, 2006, from [http://www.toezichtkansspelen.nl/cijfers/visitors\\_hc\\_2001.pdf](http://www.toezichtkansspelen.nl/cijfers/visitors_hc_2001.pdf)
- Delfabbro, P., Falzon, K., & Ingram, T. (2005). The effects of parameter variations in electronic gambling simulations: Results of a laboratory-based pilot investigation. *Gambling Research, 17*(1), 7-25.
- Delfabbro, P., Lahn, J., & Grabosky, P. (2005). *Adolescent gambling in the Australian Capital Territory (ACT)*. Report to the ACT Gambling and Racing Commission. Canberra, Australia: ANU Centre for Gambling Research.
- Delfabbro, P., Lahn, J. & Grabosky, P. (2006). It's not what you know, but how you use it: statistical knowledge and adolescent problem gambling. *Journal of Gambling Studies, 22*, 179-93.
- Delfabbro, P., & Winefield, A.H. (1999a). Poker-machine gambling: An analysis of within session characteristics. *British Journal of Psychology, 90*, 425-439.
- Delfabbro, P., & Winefield, A.H. (1999b). The danger of over-explanation in psychological research: A reply to Griffiths. *British Journal of Psychology, 90*, 425-439.
- Department for Culture, Media and Sport. (2006). *Gaming, betting and lotteries: The categories of gaming machine regulations 2006*. Draft Statutory Instruments. Retrieved December 22, 2006, from [http://www.culture.gov.uk/NR/rdonlyres/816F4118-410C-4E11-8233-270644FB6B24/0/gamingmachines\\_draftregulations.pdf](http://www.culture.gov.uk/NR/rdonlyres/816F4118-410C-4E11-8233-270644FB6B24/0/gamingmachines_draftregulations.pdf)
- d'Hondt, R. (2007). *Seventeen Years of Responsible Gaming Policy at Holland Casino*. Presentation at the 6<sup>th</sup> Annual Alberta Gaming Research Institute Annual Conference. Banff, Alberta. March 31, 2007. [http://gaming.uleth.ca/agri\\_downloads/4234/d'Hondt.ppt](http://gaming.uleth.ca/agri_downloads/4234/d'Hondt.ppt)
- Dickerson, M.G. (1979). FI schedules and persistence at gambling in the U.K. betting office. *Journal of Applied Behavior Analysis, 12*, 315-323.
- Dickerson, M.G. (1993). Internal and external determinants of persistent gambling: Problems in generalising from one form of gambling to another. *Journal of Gambling Studies, 9*, 225-245.
- Dickerson, M.G., Cunningham, R., Legg-England, S., & Hinchy, J. (1991). On the determinants of persistent gambling behaviour: III: Personality, prior mood, and poker machine play. *The International Journal of the Addictions, 26*, 531-548.



- Dickerson, M.G., Hinchy, J., England, S.L., Fabre, J., & Cunningham, R. (1992). On the determinants of persistent gambling behaviour: I: High-frequency poker machine players. *British Journal of Psychology*, *83*, 237-248.
- Dixon, M.R., & Schreiber, J.B. (2002). Utilizing a computerized video poker simulation for the collection of data on gambling behaviour. *Psychological Record*, *52*, 417-428.
- Dowling, N., Smith, D., & Thomas, T. (2005). Electronic gaming machines: Are they the ‘crack-cocaine’ of gambling? *Addiction*, *100*(1), 33 - 45.
- Dupperrex, O., Roberts, I., & Bunn, F. (2006). Safety education of pedestrians for injury prevention (Cochrane Review). *The Cochrane Library 2006; Volume 1*.
- Durlak, J.A. (1997). Primary prevention programs in schools. *Advances in Clinical Child Psychology*, *19*, 283-318.
- Durlak, J. A., & Wells, A. M. (1997). Primary prevention mental health programs for children and adolescents: A meta-analytic review. *American Journal of Community Psychology*, *25*, 115-152.
- Eisley, M., & Allegood, J. (2006). *Video poker phaseout to begin* (reprinted from News and Observer, September 29). Available at <http://www.responsiblegambling.org>
- Ellery, M., Stewart, S. H., & Loba, P. (2005). Alcohol’s effects on video lottery terminal (VLT) play among probable pathological and non-pathological gamblers. *Journal of Gambling Studies*, *21*(3), 299-324.
- Ellickson, P.L., Collins, R.L., Hambarsoomians, K., & McCaffrey, D.F. (2005). Does alcohol advertising promote adolescent drinking? Results from a longitudinal assessment. *Addiction*, *100*, 235-246.
- Felsher, J. R., Derevensky, J. L., & Gupta, R. (2004). Lottery playing amongst youth: Implications for prevention and social policy. *Journal of Gambling Studies*, *20*, 127–153.
- Ferland, F., Ladouceur, R., & Jacques, C. (2000). *Evaluation of a gambling prevention program for youth*. Paper presented at 14th National Conference on Problem Gambling, October, 2000, Philadelphia, PA, USA.
- Ferland, F., Ladouceur, R., & Vitaro, F. (2002). Prevention of problem gambling: Modifying misconceptions and increasing knowledge. *Journal of Gambling Studies*, *18*(1), 19-29.
- Ferster, C.B., & Skinner, B.F. (1957). *Schedules of reinforcement*. New York: Appleton-Century Crofts.

- Finlay, K., Marmurek, H.H.C., Kanetkar, V., and Londerville, J. (2007). *Assessing the Contribution of Gambling Venue Design Elements to Problem Gambling Behaviour*. Final Report prepared for the Ontario Problem Gambling Research Centre. January 19, 2007. <http://www.gamblingresearch.org/contentdetail.sz?cid=2654&pageid=0>
- Fisher, J.C. (1993). *Advertising, alcohol consumption, and abuse: A worldwide survey*. Westport, CT: Greenwood Press.
- Fisher, S. (2000). Measuring the prevalence of sector-specific problem gambling: A study of casino patrons. *Journal of Gambling Studies*, 16 (1), 25-51.
- Flinn, B. (2006, April 8). Unplugged VLTs don't turn off gambling revenue. *The Daily News (Halifax)*, p. 4.
- Floyd, K., Whelan, J. P., & Meyers, A.W. (2006). Use of warning messages to modify gambling beliefs and behaviour in a laboratory investigation. *Psychology of Addictive Behaviors*, 20(1), 69-74.
- Focal Research Consultants (2007). *Assessment of the behavioural Impact of the responsible Gaming Device (RGD) Features: Analysis of Nova Scotia Player-Card Data – The Windsor Trial*. Report prepared for the Nova Scotia Gaming Corporation. Feb 1, 2007. Available at [http://www.nsgc.ca/pdf/Focal%20Research%20Report%20\\_2\\_.pdf](http://www.nsgc.ca/pdf/Focal%20Research%20Report%20_2_.pdf)
- Fong, G. T., Krantz, D. H., & Nisbett, R. E. (1993) The effects of statistical training on thinking about everyday problems. In R.E. Nisbett et al. (Eds.), *Rules for reasoning* (pp. 91-135). Hillsdale, NJ: Erlbaum.
- Foxcroft, D. R., Ireland, D., Lowe, G., & Breen, R. (2005). Primary prevention for alcohol misuse in young people (Cochrane Review). *Cochrane Library 2006, Volume 1*.
- Foxcroft, D. R., Lister-Sharp, D., & Lowe, G. (1997). Alcohol misuse prevention for young people: A systematic review reveals methodological concerns and lack of reliable evidence of effectiveness. *Addiction*, 92, 531-537.
- Franklin, C., Grant, D., Corcoran, J., Miller, P., & Bultman, L. (1997). Effectiveness of prevention programs for adolescent pregnancy: A meta-analysis. *Journal of Marriage & the Family*, 59, 551-567.
- Fusco, C. (2006). Illinois casinos to check IDs for addicts. *Chicago Sun-Times*. June 23, 2006.
- G4 Newsletter (2006). Nordic News: Ban against bank notes in Norway. Volume 3, Issue 1, page 4. Retrived April 24, 2007 from [http://www.gx4.com/newsletters/G4\\_Newsletter\\_9\\_July\\_2006.pdf](http://www.gx4.com/newsletters/G4_Newsletter_9_July_2006.pdf).
- Gaboury, A., & Ladouceur, R. (1993). Evaluation of a prevention program for pathological gambling among adolescents. *Journal of Primary Prevention*, 14, 21-28.

- Gamblers Anonymous. (2006). *Gamblers Anonymous international directory*. Retrieved August 4, 2006, from <http://www.gamblersanonymous.org/mtgdirSC.html>
- Gates, S., McCambridge, J., Smith, L. A., & Foxcroft, D. R. (2005). Interventions for prevention of drug use by young people delivered in non-school settings (Cochrane Review). *Cochrane Library 2006, Volume 1*.
- Gerstein, D. R., Volberg, R. A., Toce, M. T., Harwood, H., Johnson, R. A., Buie, T., et al. (1999). *Gambling impact and behavior study*. Report to the National Gambling Impact Study Commission. Chicago: National Opinion Research Center, University of Chicago.
- Giacopassi, D., Stitt, B.G., & Vandiver, M. (1998). An analysis of the relationship of alcohol to casino gambling among college students. *Journal of Gambling Studies, 14*, 135-152.
- Gibson, B., Sanbonmatsu, D.M., & Posavac, S.S. (1997). The effects of selective hypothesis testing on gambling. *Journal of Experimental Psychology: Applied, 3*(2), 126-142.
- Govoni, R., Frisch, G.R., Rupcich, N., & Getty, H. (1998). First year impacts of casino gambling in a community. *Journal of Gambling Studies, 14*(4), 347-358.
- Grant, J. E., & Kim, S. W. (2001). Demographic and clinical features of 131 adult pathological gamblers. *Journal of Clinical Psychiatry, 62*, 957-962.
- Grant, J., Kushner, M. G., & Kim, S. W. (2002). Pathological gambling and alcohol use disorder. *Alcohol Health and Research World, 26*, 143-150.
- Griffiths, M. (1993). Fruit machine gambling: The importance of structural characteristics. *Journal of Gambling Studies, 9*(2), 101-120.
- Griffiths, M., & Parke, J. (2005). The psychology of music in gambling environments: An observational research note. *Journal of Gambling Issues, 13*, 1-12.
- Griffiths, M., & Swift, G. (1992). The use of light and colour in gambling arcades: A pilot study. *Society for the Study of Gambling Newsletter, 21*, 16-22.
- Grilli, R., Ramsay, C., & Minozzi, S. (2004). Mass media interventions: Effects on health services utilization (Cochrane Review). *Cochrane Library 2006, Volume 1*.
- Grinols, E. L. (2004). *Gambling in America: Costs and benefits*. Cambridge, UK: Cambridge University Press.
- Gruenewald, P.J., Ponicki, W.R., & Holder, H.D. (1993). The relationship of outlet densities to alcohol consumption: A time series cross-sectional analysis. *Alcoholism: Clinical and Experimental Research, 17*(1), 38-50.

- Hann, R.G., & Nuffield, J. (2005). *Local community impacts of the charity casinos*. Final Report prepared for the Ontario Ministry of Health and Long-Term Care. December 14, 2005. Retrieved July 5, 2006, from <http://www.gamblingresearch.org/contentdetail.sz?cid=3159>
- Harrahs Entertainment. (2004). *Operation Bet Smart*. Retrieved July 30, 2006, from [http://www.harrahs.com/about\\_us/responsible\\_gaming/index.html#Operation](http://www.harrahs.com/about_us/responsible_gaming/index.html#Operation)
- Harvey, P.J., Swayze, J.P., Walls, W.D. (2004). The revealed revenue effects of gambling taxation: Logit analysis of better behaviour in a laboratory casino. *International Journal of Management*, 21 (4), 407-414.
- Heath, D.B. (1995). *International handbook on alcohol and culture*. Westport, CT: Greenwood Press.
- Hepburn, L.M., & Hemenway, D. (2004). Firearm availability and homicide: A review of the literature. *Aggression and Violent Behavior*, 9(4), 417-447.
- Hing, N. (2003). *An assessment of member awareness, perceived adequacy and perceived effectiveness of responsible gambling strategies in Sydney Clubs*. Centre for Gambling Education and Research, Southern Cross University, Lismore.
- Hodgins, D.C. (2005). *What is the impact of gambling availability on gambling problems?* Paper presented at the Alberta Gaming Research Institute's 5<sup>th</sup> Annual Conference. Banff, Alberta. April 20-22<sup>nd</sup>, 2006. Retrieved July 19, 2006, from [http://gaming.uleth.ca/agri\\_downloads/4013/Hodgins.pdf](http://gaming.uleth.ca/agri_downloads/4013/Hodgins.pdf)
- Hodgins, D.C., & el-Guebaly, N. (2000). Natural and treatment-assisted recovery from gambling problems: A comparison of resolved and active gamblers. *Addiction*, 95(5), 777-789.
- Hodgins, D.C., & Peden, N. (2005, September). Natural course of gambling disorders: Forty-month follow-up. *Journal of Gambling Issues*, 14. Retrieved July 3, 2006, from [http://www.camh.net/egambling/issue14/jgi\\_14\\_hodgins.html](http://www.camh.net/egambling/issue14/jgi_14_hodgins.html)
- Holder, H. D. (2005). Community prevention of young adult drinking and associated problems. *Alcohol Research & Health*, 28(4), 245-249.
- Holland Casino. (2006). *Facts and figures*. Retrieved September 13, 2006, from <http://www.hollandcasino.com/en-GB/problem+gambling+prevention+policy/facts+and+figures/default.htm>
- Hospitality Association of New Zealand. (2005). Annual report 2005. Retrieved September 28, 2006, from <http://www.hanz.org.nz/files/HANZ%20Annual%20Report%202005.pdf>
- Independent Gambling Authority. (2005). *Inquiry into smartcard technology*. (South Australia). Retrieved August 2, 2006, from <http://www.iga.sa.gov.au/pubcons/smartcrd/SCTInqRep-final-web.pdf>

- Independent Pricing and Regulatory Tribunal. (2004). *Gambling: Promoting a culture of responsibility: Final report*. Retrieved July 6, 2006, from [http://www.dgr.new.gov.au/pdfs/ipart\\_report.pdf](http://www.dgr.new.gov.au/pdfs/ipart_report.pdf)
- International Centre for Youth Gambling Problems and High-Risk Behaviors. (IGYGPHRB). (2004). *New CD ROM prevention tool*. Retrieved August 28, 2006, from [http://www.education.mcgill.ca/gambling/en/pre\\_project.htm](http://www.education.mcgill.ca/gambling/en/pre_project.htm).
- Jackson, A. C., Thomas, S. A., Thomason, N., & Ho, W. (2002). *Longitudinal evaluation of the effectiveness of problem gambling counselling services, community education strategies and information products – Volume 3: Community education strategies and information products*. Victoria, Australia: Victorian Department of Human Services.
- Jacobs, D. F. (2004). Youth gambling in North America: Long-term trends and future prospects. In J. Derevensky and R. Gupta (Eds.), *Gambling problems in youth: Theoretical and applied perspectives* (pp. 1–24). New York: Kluwer Academic/Plenum Publishers.
- Jacques, C., & Ladouceur, R. (2006). A prospective study of the impact of opening a casino on gambling behaviors: 2- and 4-year follow-ups. *Canadian Journal of Psychiatry, 51*(12), 764-773.
- Jacques, C., Ladouceur, R., & Ferland, F. (2000). Impact of availability on gambling: A longitudinal study. *Canadian Journal of Psychiatry, 45*, 810-815.
- Janz, N.K., Champion, V.L., & Strecher, V.J. (2002). The Health Belief Model. In Glanz, K., Rimer, B.K., Lewis, F.M. (eds.), *Health Behavior and Health Education*. Wiley.
- Johansson, A., & Götestam, K. G. (2003). Gambling and problematic gambling with money among Norwegian youth (12–18 years). *Nordic Journal of Psychiatry, 57*, 317–321.
- Jones, E.F., Beniger, J.R., & Westoff, C.F. (1980). Pill and IUD discontinuation In the United States, 1970-1975: The influence of the media. *Family Planning Perspectives, 12*(6), 293-300.
- Kassinove, J.I., & Schare, M.L. (2001). Effects of the ‘near miss’ and the ‘big win’ on persistence at slot machine gambling. *Psychology of Addictive Behaviors, 15*(2), 155-158.
- Kearney, M.S. (2002). *State lotteries and consumer behavior*. National Bureau of Economic Research Working Paper 9330. Issued November 2002. Retrieved June 29, 2006, from <http://www.nber.org/papers/w9330>.
- Ker, K., & Chinnock, P. (2006). Interventions in the alcohol server setting for preventing injuries. *Cochrane Database of Systematic Reviews, 3*, March 2006.
- Killias, M., van Kesteren, J., & Rindlisbacher, M. (2001). Guns, violent crime, and suicide in 21 countries. *Canadian Journal of Criminology, 43*(4), 429-448.

- Knapp, T.J. (1976). A functional analysis of gambling behaviour. In W.R. Eadington (Ed.), *Gambling and society* (pp. 276-294). Springfield, IL: Thomas.
- Korn, D., Hurson, T., & Reynolds, J. (2005). *Commercial Gambling Advertising: Possible Impact on Youth Knowledge, Attitudes, Beliefs and behavioural Intentions*. Final Report submitted to the Ontario Problem Gambling Research Centre. April 2005.  
<http://www.gamblingresearch.org/download.sz/125%20Final%20Report%20-%2012APR05.pdf?docid=6481>
- Kosonen, P., & Winne, P. H. (1995). Effects of teaching statistical laws on reasoning about everyday problems. *Journal of Educational Psychology*, 87, 33-46.
- Kumpfer, K. L., & Alvarado, R. (2003). Family-strengthening approaches for the prevention of youth problem behaviors. *American Psychologist*, 58 (6/7), 457-465.
- Kyngdon, A., & Dickerson, M. (1999). An experimental study of the effect of prior alcohol consumption on a simulated gambling activity. *Addiction*, 94(5), 697-707.
- Ladouceur, R., Boutin, C., Doucet, C., Dumont, M., Provencher, M., Giroux, I., & Boucher, C. (2004). Awareness promotion about excessive gambling among video lottery retailers. *Journal of Gambling Studies*, 20, 181-185.
- Ladouceur, R., Ferland, F., Vitaro, F., & Pelletier, O. (2005). Modifying youths' perception toward pathological gamblers. *Addictive Behaviors*, 30, 351-354.
- Ladouceur, R., Jacques, C., Giroux, I., Ferland, F., & LeBlond, J. (2000). Analysis of a casino's self-exclusion program. *Journal of Gambling Studies*, 16, 453-460.
- Ladouceur, R., Jacques, C., Sevigny, S. & Cantinotti, M. (2005). Impact of the format, arrangement and availability of electronic gaming machines outside casinos on gambling. *International Gambling Studies*, 5(2), 139-154.
- Ladouceur, R., & Sevigny, S. (2003). Interactive messages on video lottery terminals and persistence in gambling. *Gambling Research*, 15, 45-50.
- Ladouceur, R., & Sevigny, S. (2005). Structural characteristics of video lotteries: Effects of a stopping device on illusion of control and gambling persistence. *Journal of Gambling Studies*, 21(2), 117-131.
- Ladouceur, R., & Sevigny, S. (2006, August). The impact of video lottery game speed on gamblers. *Journal of Gambling Issues*, 17. Retrieved August 26, 2006, from <http://www.camh.net/egambling/issue17/ladouceur.html>
- Ladouceur, R., Sylvain, C., & Boutin, C. (2000). Pathological gambling. In M. Hersen, M. Biaggio et al. (Eds.), *Effective brief therapies: A clinician's guide* (pp. 303-318). San Diego: Academic Press.

- Ladouceur, R., Sylvain, C., Gosselin, P. (2007). Self-Exclusion Program: A Longitudinal Evaluation Study. *Journal of Gambling Studies*, 23 (1), 85-94.
- Ladouceur, R., Sylvain, C., Letarte, H., Giroux, I., & Jacques, C. (1998). Cognitive treatment of pathological gamblers. *Behavior Research & Therapy*, 36, 1111-1119.
- Ladouceur, R., Vezina, L., Jacques, C., & Ferland, F. (2000). Does a brochure about pathological gambling provide new information? *Journal of Gambling Studies*, 16(1), 103-107.
- Lalumiere, M., Williams, R.J., & Morgan, M. (2006). *Effects of observers on VLT play*. Report prepared for the Alberta Gaming Research Institute. University of Lethbridge: Authors. <http://www.abgaminginstitute.ualberta.ca/lalumiere.cfm>
- Lambos, C., & Delfabbro, P. (2007). Numerical reasoning ability and irrational beliefs in problem gambling. *International Gambling Studies*, 7 (2), 157-171.
- Langer, E.J. (1975). The illusion of control. *Journal of Personality and Social Psychology*, 32, 311-328.
- Lavoie, M-P., & Ladouceur, R. (2004, February). Prevention of gambling among youth: Increasing knowledge and modifying attitudes toward gambling. *Journal of Gambling Issues (formerly eGambling: The Electronic Journal of Gambling Issues)*, 10. Retrieved July 31, 2006, from [http://www.camh.net/egambling/issue10/ejgi\\_10\\_lavoie\\_ladouceur.html](http://www.camh.net/egambling/issue10/ejgi_10_lavoie_ladouceur.html)
- Lester, D. (1994). Access to gambling opportunities and compulsive gambling. *International Journal of the Addictions*, 29(12), 1611-1616.
- Levitz, L.S. (1971). The experimental induction of compulsive gambling behaviours. *Dissertation Abstracts International*, 32(2-13), 1216-1217.
- Lewis, D.J., & Duncan, C.P. (1956). Effect of different percentages of money reward on extinction of a lever-pulling response. *Journal of Experimental Psychology*, 52(1), 23-27.
- Lewis, D.J., & Duncan, C.P. (1957). Expectation and resistance to extinction of a lever-pulling response as functions of percentage or reinforcement and amount of reward. *Journal of Experimental Psychology*, 54(2), 115-120.
- Lewis, D.J., & Duncan, C.P. (1958). Expectation and resistance to extinction of a lever-pulling response as a function of percentage or reinforcement and number of acquisition trials. *Journal of Experimental Psychology*, 55(2), 121-128.
- Lichtenstein, S., Slovic, P., & Zink, D. (1969). Effect of instruction in expected value on optimality of gambling decisions. *Journal of Experimental Psychology*, 79, 236-240.

- Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, education and behavioural treatment: Confirmation from meta-analysis. *American Psychologist*, 48, 1181-1209.
- Loba, P., Stewart, S. H., Klein, R. M., & Blackburn, J. R. (2002). Manipulations of the features of standard video lottery terminal (VLT) games: Effects in pathological and non-pathological gamblers. *Journal of Gambling Studies*, 17(4), 297-320.
- Lovato, C., Linn, G., Stead, L.F., & Best, A. (2006). Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours. *Cochrane Database of Systematic Reviews*, 3.
- Market Wire. (2000, July). Imagis installs casino-ID And biometric facial recognition software in Gateway Casinos. Retrieved July 11, 2006, from [http://www.findarticles.com/p/articles/mi\\_pwwi/is\\_200007/ai\\_mark01013182](http://www.findarticles.com/p/articles/mi_pwwi/is_200007/ai_mark01013182).
- Marshall, K., & Wynne, H. (2003). Fighting the odds. *Perspectives on Labour and Income*, 4 (12), 5-13. Statistics Canada.
- Mazza, J. J. (1997). School-based suicide prevention programs: Are they effective? *School Psychology Review*, 26, 382-396.
- McDonnell-Phillips Pty Ltd. (2006). *Analysis of gambler precommitment behaviour*. Report to the National Gambling Research Program Working party on behalf of the Australian Ministerial Council on Gambling, Brisbane.
- McMillen, J. (1998). *Study of the social and economic impacts of New Zealand casinos*. Sydney: Australian Institute for Gambling Research.
- McMillen, J., Marshall, D., & Murphy, L. (2004). *The use of ATMs in ACT gaming venues: An empirical study*. Report to the ACT Gambling and Racing Commission. Canberra: Australian National University Centre for Gambling Research.
- McMillen, J., & Pitt, S. (2005). *Review of the ACT Government's harm minimisation measures*. Retrieved July 10, 2006, from <http://gambling.anu.edu.au/menu/PDFs/Policy%20Review-Final-withISBN.pdf>
- Mehmel, B. (2006). *Responsible gaming information centers: Making player information accessible*. Retrieved July 30, 2006, from [http://www.unr.edu/gaming/13th\\_Conference\\_Web\\_files/Files/Abstracts/](http://www.unr.edu/gaming/13th_Conference_Web_files/Files/Abstracts/)
- Merzel, C., & D'Afflitti, J. (2003). Reconsidering community-based health promotion: Promise, performance, and potential. *American Journal of Public Health*, 93(4), 557-574.
- Miller, N.S., & Flaherty, J.A. (2002). Effectiveness of coerced addiction treatment: A review of the clinical research. *Journal of Substance Abuse Treatment*, 18, 9-16.



- Ministry of Health. (2006, August 1). *Poorer people still hardest hit by problem gambling*. New Zealand Ministry of Health Media Release. Retrieved December 22, 2006, from <http://www.moh.govt.nz/moh.nsf/UnidPrint/MH5021?OpenDocument>
- Mosher, J.F., Toomey, T.L., Good, C., Harwood, E., & Wagenaar, A.C. (2002). State laws mandating or promoting training programs for alcohol servers and establishment managers: An assessment of statutory and administrative procedures. *Journal of Public Health Policy*, 23(1), 90-113.
- Mullen, P.D., Simons-Morton, D.G., Ramirez, G., et al. (1997). A meta-analysis of trials evaluating patient education and counseling for three groups of preventative health behaviors. *Patient Education and Counseling*, 32, 157-73.
- Murray, R. (2003). *Centre for Addiction and Mental Health's approach to supporting community-based problem gambling awareness initiatives*. Toronto, ON: CAMH.
- Najavits, L.M., Grymala, L.D., & George, B. (2003). Can advertising increase awareness of problem gambling? A statewide survey of impact. *Psychology of Addictive Behaviors*, 17(4), 324-327.
- Napolitano, F. (2003). The self-exclusion program: legal and clinical considerations. *Journal of Gambling Studies*, 19(3), 303-315.
- Nation, M., Crusto, C., Wandersman, A., Kumpfer, K. L., Seybolt, D., Morrissey-Kane, E., & Davino, K. (1993). What works in prevention. *American Psychologist*, 58(6/7), 449-456.
- National Gambling Board. (2005). *National Gambling Board annual report 2005*. Retrieved August 24, 2006, from [http://www.ngb.org.za/uploads/7\\_NGBAnnualReport2005.pdf](http://www.ngb.org.za/uploads/7_NGBAnnualReport2005.pdf)
- National Gambling Impact Study Commission (NGISC). (1999). *Final report*. Washington, DC: Author.
- National Institute of Public Health. (2002). *European comparative alcohol study*. Swedish National Institute of Public Health & the European Commission. Retrieved September 23, 2006, from [http://www.fhi.se/templates/Page2cols\\_616.aspx](http://www.fhi.se/templates/Page2cols_616.aspx)
- National Research Council (NRC) (1999). *Pathological gambling: A critical review*. Committee on the Social and Economic Impact of Pathological Gambling, Committee on Law and Justice, Commission on Behavioral and Social Sciences and Education, and the National Research Council. Washington, DC: National Academy Press.
- Nisbet, S. (2005). Responsible gambling features of card-based technologies. *eCommunity: International Journal of Mental Health & Addiction*, 3(2), 54-63.
- Nova Scotia Gaming Corporation. (2005). *VLT time change: Findings report*. Retrieved August 15, 2006, from <http://www.gamingcorp.ns.ca/>

- Nowatzki, N. R., & Williams, R. J. (2002). Casino self-exclusion programs: A review of the issues. *International Gambling Studies*, 2, 3-25.
- Ólason, D. T., Sigurdardóttir, K. J., & Smári, J. (2006). Prevalence estimates of gambling participation and problem gambling among 16 to 18 year old students in Iceland: A comparison of the SOGS-RA and DSM-IV-MR-J. *Journal of Gambling Studies*, 22, 23–39.
- Online Casinos.com. (2006, June 19). *Help for addicted online gamblers*. Available at <http://www.responsiblegambling.org>.
- Omnifacts Bristol Research. (2005, September). *Nova Scotia player card research project: Stage I research report*. Retrieved August 2, 2006, from <http://www.gamingcorp.ns.ca/pdf/Stage%20I%20Report%20FINAL.pdf>
- Omnifacts Bristol Research. (2007, January). *Nova Scotia player card research project: Stage III research report*. Retrieved May 30, 2007, from <http://www.nsgc.ca/pdf/Omnifacts%20Bristol%20Research%20Report.pdf>
- O’Neil, M., Whetton, S., Doman, B., Herbert, M., Giannopolous, V., O’Neil, D., & Wordley, J. (2003). *Part A – Evaluation of self-exclusion programs in Victoria and Part B – Summary of self-exclusion programs in Australian States and Territories*. Melbourne: Gambling Research Panel.
- Ontario Lottery & Gaming Corporation (OLG) (2007). *OLG Responsible Gaming*. Presentation by Betty Palantzas to OPGRC and Belleville Research Team. June 6, 2007.
- Pakko, M. R. (2005, June; revised 2006, May). No smoking at the slot machines: The effect of a smoke-free law on Delaware gaming revenue. *Working Paper 2005-054C, The Federal Reserve Bank of St. Louis*. Retrieved August 15, 2006, from <http://research.stlouis.org/wp/2005/2005-054.pdf>
- Paton, D., Siegel, D.S., Vaughan-Williams, L. (2004). Taxation and the demand for gambling: New evidence from the United Kingdom. *National Tax Journal*, 57 (4), 847-861.
- Pelletier, A., Ladouceur, R., Fortin, J., & Ferland, F. (2004). Assessment of high school students’ understanding of DSM-IV-MR-J items. *Journal of Adolescent Research*, 19, 224-232.
- Petrie, J., Bunn, F., & Byrne, G. (2007). Parenting programmes for preventing tobacco, alcohol or drugs misuse in children < 18: a systematic review. *Health Education Research*, 22 (2), 177-191.
- Petry, N.M., & Roll, J.M. (2001). A behavioral approach to understanding and treating pathological gambling. *Seminars in Clinical Neuropsychiatry*, 6(3), 177-83.

- Petry, N. M., Stinson, F. S., & Grant, B. F. (2005). Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: Results from the national epidemiologic survey on alcohol and related conditions. *Journal of Clinical Psychiatry*, *66*(5), 564-574.
- Phillips, J. G., Triggs, T. J., Coman, G. J., & Ogeil, R. P. (2005). Intoxication and decision aiding during computer blackjack: Preliminary analysis. *Gambling Research*, *17*(2), 17-24.
- Pittman, D.J., & White, H.R. (1991). *Society, culture, and drinking patterns re-examined*. New Brunswick, NJ: Rutgers Center of Alcohol Studies.
- Prendergast, M., Podus, D., Finney, J., Greenwell, L., & Roll, J. (2006). Contingency management for treatment of substance use disorders: A meta-analysis. *Addiction*, *101*(11), 1546-1560.
- Productivity Commission. (1999). *Australia's gambling industries* (Report No. 10). Canberra: AusInfo.
- Reiling, D.M., & Nusbaumer, M.R. (2006). When problem servers pour in problematic places: Alcoholic beverage servers' willingness to serve patrons beyond intoxication. *Substance Use & Misuse*, *41*(5), 653-668.
- Republic of South Africa. (2004). *Government gazette: No. 7 of 2004: National Gambling Act 2004*. Retrieved August 24, 2006, from [http://www.ngb.org.za/uploads/6\\_1-National\\_Gambling\\_Act.pdf](http://www.ngb.org.za/uploads/6_1-National_Gambling_Act.pdf)
- Rhea, A. (2005). Voluntary self exclusion lists: How they work and potential problems. *Gaming Law Review*, *9*(5), 462-469.
- Rodda, D., Brown, S. L., & Philips, J. G. (2004). The relationship between anxiety, smoking and gambling in electronic gaming machine players. *Journal of Gambling Studies*, *20*, 71-81.
- Room, R., Turner, N.E., & Ialomiteanu, A. (1999). Community effects of the opening of the Niagara casino. *Addiction*, *94*(10), 1449-1466.
- Rooney, B. L., & Murray, D. M. (1996). A meta-analysis of smoking prevention programs after adjustment for errors in the unit of analysis. *Health Education Quarterly*, *23*, 48-64.
- Rose, I.N. (2001). *Minimum legal age to place a bet*. Retrieved August 4, 2006, from <http://www.gamblingandthelaw.com/agechart.html>
- Rose, I. N. (2003). *Status of casino enabling laws*. Retrieved August 9, 2006, from <http://www.gamblingandthelaw.com/status.html>
- Rossen, F. (2001, December). *Youth gambling: A critical review of the public health literature*.

- Research Report for the Centre for Gambling Studies, University of Auckland. Retrieved July 28, 2006, from <http://www.health.auckland.ac.nz/population-health/gambling-studies/content/CompleteReview.pdf>
- Rush, B., Adlaf, E., Veldhuizen, S., Corea, L., & Vince, S. (2005). *Assessing the geo-spatial association in Ontario between the prevalence of problem gambling, treatment availability and help seeking*. Final Report to the Ontario Problem Gambling Research Centre, September 2005.
- Rush, B.R., Gliksman, L., Brook, R. (1986). Alcohol availability, alcohol consumption and alcohol-related damage. The distribution of consumption model. *Journal of Studies on Alcohol*, 47(1), 1-10.
- Rush, B., Veldhuizen, S., & Adlaf, E. (2007). Mapping the prevalence of problem gambling and its association with treatment accessibility and proximity to gambling venues. *Journal of Gambling Issues*, 20 (June), 193-213.
- Sadinsky, S. (2005, March). *Review of the problem-gambling and responsible-gaming strategy of the Government of Ontario*. Report to the Ontario Ministry of Health and Long-term Care and the Ministry of Economic Development and Trade. Available at <http://www.health.gov.on.ca/>
- Sani, A., Carlevaro, T., & Ladouceur, R.. (2005). Impact of a counselling session on at-risk casino patrons: A pilot study. *Gambling Research*, 17(1), 47-52.
- Saskatchewan Gaming Corporation. (2006). *SGC annual report 2005/2006*. Retrieved August 16, 2006, from <http://www.gov.sk.ca/deptsorgs/documents/SGC%20Annual%20Report%202005.pdf>
- Saskatchewan Liquor and Gaming Authority. (2006). *2005-2006 annual report*. Retrieved September 27, 2006, from <http://www.sлга.gov.sk.ca/Prebuilt/Public/SLGA%20Annual%202006.pdf>
- Sasso, W. V., & Kalajdzic, J. (2006, February). *Do Ontario and its gaming venues owe a duty of care to problem gamblers?* Final Report submitted to the Ontario Problem Gambling Research Centre. Retrieved November 29, 2006, from <http://www.gamblingresearch.org>
- Schellinck, T., & Schrans, T. (2002). *Atlantic Lottery Corporation video lottery responsible gaming feature research: Final report*. Focal Research Consultants Ltd. Retrieved July 31, 2006, from <http://www.gamingcorp.ns.ca/products/products.htm>
- Schoemaker, P.J. (1979). The role of statistical knowledge in gambling decisions: Movement versus risk dimension approaches. *Organizational Behavior and Human Decision Processes*, 24, 1-17.
- Schrans, T., Grace, J., & Schellinck, T. (2004). *2003 NS VL responsible gaming features*

*Evaluation: Final report.* Halifax, NS: Nova Scotia Gaming Corporation. Retrieved August 12, 2006, from <http://www.gamingcorp.ns.ca/pdf/2003-NS-VL-RGF-Nov9-2004.pdf>

- Schreiber, J., & Dixon, M.R. (2001). Temporal characteristics of slot machine play in recreational gamblers. *Psychological Reports, 89*(1), 67-72.
- Secker-Walker, R. H., Gnich, W., Platt, S., & Lancaster, T. (2002). Community interventions for reducing smoking among adults (Cochrane Review). *Cochrane Library 2006, Volume 1.*
- Shaffer, H. J., & Hall, M. N. (2001). Updating and refining meta-analytic prevalence estimates of disordered gambling behavior in the United States and Canada. *Canadian Journal of Public Health, 92*(3), 168-172.
- Shaffer, H.J., & Hall, M.N. (2002). Longitudinal patterns of gambling and drinking problems among casino employees. *Journal of Social Psychology, 142*, 405-424.
- Shaffer, H. J., Hall, M. N., & VanderBilt, J. V. (1997). *Estimating the prevalence of disordered gambling in the United States and Canada: A meta-analysis.* Cambridge, MA: Harvard Medical School Division of Addictions.
- Shaffer, H. J., LaBrie, R. A., & LaPlante, D. (2004). Laying the foundation for quantifying regional exposure to social phenomena: Considering the case of legalized gambling as a public health toxin. *Psychology of Addictive Behaviors, 18*(1), 40-48.
- Shaffer, H.J., VanderBilt, J., & Hall, M.N. (1999). Gambling, drinking, smoking, and other health risk activities among casino employees. *American Journal of Industrial Medicine, 36*, 365-378.
- Sharpe, L., Walker, M., Coughlan, M.J., Enersen, K., & Blaszczyński, A. (2005). Structural changes to electronic gaming machines as effective harm minimization strategies for non-problem and problem gamblers. *Journal of Gambling Studies, 21*(4), 503-520.
- Simpson, R., Goodstadt, M., Wynne, H., & Williams, R.J. (2006). *The Prevention of Problem Gambling.* Unpublished Manuscript. Ontario Problem Gambling Research Centre.
- Skaer, D. (1985). The effect of coming close in a gambling-like situation. *Dissertation Abstracts International, 46*(7-A), 557.
- Skycity Entertainment Group. (2005, August 22). *Media release: Skycity Entertainment Group announces annual profit of \$104 million.* Retrieved September 29, 2006, from [http://www.skycityentertainmentgroup.com/shadomx/apps/fms/fmsdownload.cfm?file\\_uu\\_id=E94C6CF0-7E95-D748-06BB-7D8E6991ECD3&siteName=skycity](http://www.skycityentertainmentgroup.com/shadomx/apps/fms/fmsdownload.cfm?file_uu_id=E94C6CF0-7E95-D748-06BB-7D8E6991ECD3&siteName=skycity)
- Slater, M.D., Kelly, K.J., Edwards, R.W., Thurman, P.J., Plested, G.B.A., Keefe, T.J., et al. (2005). Combining in-school and community-based media efforts: reducing marijuana and alcohol uptake among younger adolescents. *Health Education Research, 21*, 157-167.

- Slutske, W.S. (2006). Natural recovery and treatment-seeking in pathological gambling: Results of two U.S. National Surveys. *American Journal of Psychiatry*, 163(2), 297-302.
- Smart, R.G. (1988). Does alcohol advertising affect overall consumption? A review of empirical studies. *Journal of Studies on Alcohol*, 49, 314-323;
- Smart, R.G., & Mann, R.E. (1995). Treatment, health promotion and alcohol controls and the decrease of alcohol consumption and problems in Ontario: 1975 - 1993. *Alcohol & Alcoholism*, 30(3), 337-343.
- Smith, G. J., & Wynne, H. (2002). *Measuring gambling and problem gambling in Alberta: Final report using the Canadian Problem Gambling Index (C.P.G.I)*. Edmonton, AB: Alberta Gaming Research Institute.
- Smitheringale, B. (2001). *The Manitoba gambling customer assistance program: A summary report*. Retrieved July 20, 2006, from [http://www.afm.mbca/pdf/Customer\\_assistance\\_report\\_gambling.pdf](http://www.afm.mbca/pdf/Customer_assistance_report_gambling.pdf)
- South Australian Centre for Economic Studies (SACES). (2003). *Self-exclusion programs and harm minimization policies/strategies*. Report prepared for the Gambling Research Panel, Victoria. February 2003. Retrieved August 15, 2006, from <http://www.adelaide.edu.au>
- South Australian Centre for Economic Studies (SACES). (2005). *Study of the impact of caps on electronic gaming machines: Final report*. Retrieved August 15, 2006, from <http://www.justice.vic.gov.au>
- South Carolina Law Enforcement Division. (2005). *2004-2005 annual accountability report*. Retrieved August 3, 2006, from <http://www.sled.state.sc.us/default.htm>
- Sowden, A.J., & Arblaster, L. (2005). Mass media interventions for preventing smoking in young people (Cochrane Review). *Cochrane Library 2006, Volume 1*.
- Sowden, A., & Stead, L. (2005). Community interventions for preventing smoking in young people (Cochrane Review). *Cochrane Library 2006, Volume 1*.
- Stacy, A.W., Bentler, P.M., & Flay, B.R. (1994). Attitudes and health behavior in diverse populations: Drunk driving, alcohol use, binge eating, marijuana use, and cigarette use. *Health Psychology*, 13(1), 73-85.
- Stark, G.M., Saunders, D.M., & Wookey, P. (1982). Differential effects of red and blue lighting on gambling behaviour. *Current Psychological Research*, 2, 95-100.
- Steenbergh, T.A., Whelan, J.P., Meyers, A.W., May, R.K., & Floyd, K. (2004). Impact of warning and brief intervention messages on knowledge of gambling risk, irrational beliefs and behaviour. *International Gambling Studies*, 4(1), 3-16.

- Steinberg, M., & Velardo, W. (2002). *Preliminary evaluation of a casino self-exclusion program*. Paper presented at the Responsible Gambling Council of Ontario's Discovery 2002 Conference, April 2002, Niagara Falls, Canada.
- Stockwell, T., Gruenewald, P.J., Toumbourou, J.W., & Loxley, W. (2005). *Preventing harmful substance use: The evidence base for policy and practice*. New York: Wiley.
- Strasburger, V.C. (1995). *Adolescents and the media: Medical and psychological impact*. London: Sage Publications.
- Strickland, L., & Grote, F. (1967). Temporal presentation of winning symbols and slot machine playing. *Journal of Applied Psychology*, 74, 10-13.
- Sychold, M. (2006). *Study of gambling services in the internal market of the European Union: Executive summary*. Prepared for the Swiss Institute of Comparative Law. Retrieved July 22, 2006, from [http://ec.europa.eu/internal\\_market/services/gambling\\_en.htm](http://ec.europa.eu/internal_market/services/gambling_en.htm)
- Sylvain, C., Ladouceur, R., & Boisvert, J.M. (1997). Cognitive and behavioral treatment of pathological gambling: A controlled study. *Journal of Consulting & Clinical Psychology*, 65, 727-732.
- Thomas, R., & Perera, R. (2006). School-based programmes for preventing smoking. *Cochrane Database of Systematic Reviews*, 3.
- Toneatto, T., Ferguson, D., & Brennan, J. (2003). Effect of a new casino on problem gambling in treatment-seeking substance abusers. *Canadian Journal of Psychiatry*, 48(1), 40-44.
- Toumbourou, J.W., Williams, J., Waters, E., & Patton, G. (2005). What do we know about preventing drug-related harm through social developmental intervention with children and young people? In T. Stockwell et al. (eds), *Preventing harmful substance use: The evidence for policy and practice* (pp 87-100). New York: Wiley.
- Townshend, P. & Stanfield, J. (2007). The Behaviour of Machine Gambling users in a Natural Environment: The Implications for Host Responsibility. *Poster Presentation at the Alberta Gaming Research Institute's Annual Conference*. Banff, Alberta, March 30-31, 2007.
- Turner, N.E., Wiebe, J., Falkowski-Ham, A., Kelly, J., & Skinner, W. (2005). Public awareness of responsible gambling and gambling behaviours in Ontario. *International Gambling Studies*, 5(1), 95-112.
- U.S. moving to limit access to online gambling. (2006, July 12). *The Lethbridge Herald*, p. A3.
- Vaillant, G.E. (1995). *The natural history of alcoholism revisited*. Cambridge, MA: Harvard University Press.

- Victoria Department of Human Services. (2002). *Annual report, 2001-2002*. Victoria, AU: Author.
- Vidanapathirana, J., Abramson, M.J., Forbes, A., Fairley, C. (2004). Mass media interventions for promoting HIV testing (Cochrane Review). *Cochrane Library 2006, Volume 1*.
- Wagenaar, A.C., & Holder, H.D. (1995). Changes in alcohol consumption resulting from the elimination of retail wine monopolies: Results from five U.S. States. *Journal of Studies on Alcohol, 56*(5), 566-72.
- Wagenaar, A.C., & Langley, J.D. (1994). Alcohol licensing system changes and alcohol consumption: Introduction of wine into New Zealand grocery stores. *Addiction, 90*(6), 773-83.
- Walker, M.B. (2001). Strategies for winning on poker machines. In A. Blaszczynski et al. (Eds.), *Culture and the gambling phenomenon: Proceedings of the 12<sup>th</sup> annual conference of the National Association for Gambling Studies* (pp. 391-396). Sydney, AU: Author.
- Wandersman, A., & Florin, P. (2003). Community interventions and effective prevention. *American Psychologist, 58*(6/7), 441-448.
- Weatherly, J.N., & Brandt, A.E. (2004). Participants' sensitivity to percentage payback and credit value when playing a slot-machine simulation. *Behavior and Social Issues, 13*, 33-50.
- Weiss, J.W., Cen, S., Schuster, D.V., Unger, J.B., Johnson, C.A., Mouttapa, M. et al. (2006). Longitudinal effects of pro-tobacco and anti-tobacco messages on adolescent smoking susceptibility. *Nicotine & Tobacco Research, 8*(3), 455-465.
- Weissberg, R.P. & Gullotta, T.P. (1997). *Healthy Children 2010: Enhancing Children's Wellness. Issues in Children's and Families' Lives, Vol 8*. Thousand Oaks, Ca: Sage.
- Weissberg, R.P., & Gullotta, T.P. (1997). *Healthy children 2010: Enhancing children's wellness. Issues in children's and families' lives, Vol. 8*. Thousand Oaks, CA: Sage.
- Welte, J. W., Wieczorek, W. F., Barnes, G. M., Tidwell, M-C., & Hoffman, J. H. (2004). The relationship of ecological and geographic factors to gambling behavior and pathology. *Journal of Gambling Studies, 20*(4), 405-423.
- Wiebe, J., Cox, B., & Falkowski-Ham, A. (2003, October). *Psychological and social factors associated with problem gambling in Ontario: A one year follow-up study*. Final Report submitted to the Ontario Problem Gambling Research Centre. Retrieved July 20, 2006, from <http://www.gamblingresearch.org/download.sz/social%20psychological%20factors%20final%20report.pdf?docid=3829>
- Wild, T.C., Roberts, A.B., & Cooper, E.L. (2002). Compulsory substance abuse treatment: An



- overview of recent findings and issues. *European Addiction Research*, 8, 84-93.
- Williams, R.J., & Connolly, D. (2006). Does learning more about the mathematics of gambling change gambling behaviour? *Psychology of Addictive Behaviors*, 20(1), 62-68.
- Williams, R.J., Connolly, D., Wood, R.T., & Currie, S. (2003). *Prevention of problem gambling: Lessons learned from two Alberta programs*. Proceedings of the 13<sup>th</sup> National Association of Gambling Studies Conference (Australia). Canberra: NAGS.
- Williams, R.J., Connolly, D., Wood, R., Currie, S., & Davis, R.M. (2004). Program findings that inform curriculum development for the prevention of problem gambling. *Gambling Research*, 16(1), 47-69.
- Williams, R.J., & Gloster, S.P. (1999). Knowledge of fetal alcohol syndrome (FAS) among Natives in Northern Manitoba. *Journal of the Studies on Alcohol*, 60, 833-836.
- Williams, R. J., & Wood, R. T. (2004a). The proportion of gaming revenue derived from problem gamblers: Examining the issues in a Canadian context. *Analyses of Social Issues and Public Policy*, 4(1), 33-45.
- Williams, R.J., & Wood, R.T. (2004b). *Demographic sources of Ontario gaming revenue*. Final Report submitted to the Ontario Problem Gambling Research Centre, June 23, 2004. Available at <http://www.gamblingresearch.org/contentdetail.sz?cid=198&pageid=1042&r=s>
- Williams, R.J., & Wood, R.T. (in press). The proportion of Ontario gambling revenue derived from problem gamblers. *Canadian Public Policy*.
- Williams, R.J., Wood, R.T., & Currie, S. (in preparation). *Stacked Deck: An effective high school curriculum to prevent problem gambling*.
- Williamson, A., & Walker, M. (2000). Strategies for solving the insoluble: Playing to win Queen of the Nile. In G. Coman (Ed.), *Lessons of the past: Proceedings of the 11<sup>th</sup> annual conference of the National Association for Gambling Studies* (pp. 444-452). Victoria, AU: NAGS.
- Windle, M., & Scheidt, D.M. (2004). Alcoholic subtypes: Are two sufficient? *Addiction*, 99(12), 1508-1519.
- Wines & Vines (2005, April). *New Mexico: Lawmaker proposes alcohol sales ban for DUI offenders*. Available at [http://www.findarticles.com/p/articles/mi\\_m3488/is\\_4\\_86/ai\\_n13698952](http://www.findarticles.com/p/articles/mi_m3488/is_4_86/ai_n13698952).
- Winters, K.C., Fawkes, T., Fahnhorst, M., Botzet, A., August, G. (2007). A synthesis review of exemplary drug abuse prevention programs in the United States. *Journal of Substance Abuse Treatment*, 32, 371-380.

- Wohl, M. J. A., & Enzle, M. E. (2003). The effects of near wins and near losses on self-perceived personal luck and subsequent gambling behavior. *Journal of Experimental Social Psychology, 39*, 184-191.
- Wood, R.T., & Williams, R.J. (2007a). Internet gambling: Past, present and future. In G. Smith, D. Hodgins, & R. Williams (Eds.), *Research and Measurement Issues in Gambling Studies*. pp 486-502. San Diego, CA: Elsevier.
- Wood, R.T., & Williams, R.J. (2007b). Problem gambling on the Internet: Implications for Internet gambling policy in North America. *New Media and Society, 9*(3), 520-542.
- Worden, J.K., Flynn, B.S., Geller, B.M., Chen, M., Shelton, L.G., & Secker-Walker, R.H. (1988). Development of a smoking prevention mass media program using diagnostic and formative research. *Preventive Medicine, 17*, 531-558.
- Wynne, H. J., & Stinchfield, R. (2004, April). *Evaluating responsible gaming features and interventions in Alberta: Phase I – Final report*. Retrieved July 8, 2006, from [http://www.aglc.gov.ab.ca/pdf/gaming/news\\_releases/VLT\\_responsible\\_features\\_phase1\\_report.pdf](http://www.aglc.gov.ab.ca/pdf/gaming/news_releases/VLT_responsible_features_phase1_report.pdf)
- Yogonet.com (2006). Casinos to contribute with more than US \$30 million to the Panamenian state in 2006. Retrieved April 23, 2007 from: <http://www.yogonet.com/english/detallenoticia.asp?id=6458>