FINAL REPORT

PREPARED BY:

LIA NOWER, J.D., PH.D.

ALEX BLASZCZYNSKI, PH.D.

BACKGROUND

The 2008 Report prepared by Livingstone, Woolley, Zazryn, Bakacs and Shami on behalf of the Australian Institute for Primary Care (AIPC) for the Independent Gambling Authority (IGA) South Australia seeks to determine the relevance and role of electronic gaming machine (EGMs[1]) and game features on the play of problem gamblers. In meeting its objectives, this Report attempts to answer five research questions ("terms of reference", p. 20):

- If particular gaming machine games feature more commonly in the play of problem gamblers as compared to recreational gamblers;
- Whether there are particular characteristics of those games that distinguish them from other games;
- Whether those differences are the characteristics that attract problem gamblers and feature in problem gambling play;
- To what extent those characteristics affect the play of recreational gamblers; and
- To what extent those characteristics feature in a gamblers' transition from recreational to problem gambler.

The methodology employed in this Report included a literature review summarizing the current state of knowledge regarding EGMs and player behaviour, a statistical analysis of data related to the performance of EGMs in South Australia provided by the Office of the Liquor and Gambling Commissioner (South Australia), quantitative data collected from a telephone survey of 180 regular EGM gamblers, and qualitative data elicited from focus groups and individual interviews involving 64 problem gamblers.

The data set provided to the authors of the Report was not available for further analyses and, therefore, apart from the methodology employed, no comment can be made on the accuracy and validity of the statistical findings as they are described in the Report.

Introduction

From the outset, it is important to state that the timeframe for reviewing and commenting on the Report was extremely limited. Accordingly, it was decided to restrict our review to the broad methodological issues that we considered relevant in determining the validity and reliability of the conclusions reached by the authors. We did not include a detailed critique of the literature beyond what was required for our analysis. It is our perspective that the validity of the Report's conclusions rests on the adequacy of the methodology and procedures used in attempting to answer the research questions contained in the terms of reference. If the methodology is fundamentally flawed, the interpretation of results and conclusions drawn must be treated with caution.

It would appear that some of the underlying objectives of the report were to determine whether: (a) problem as compared to recreational gamblers demonstrate a stable preference for certain features of EGMs; and whether (b) those features attract problem

[1] NOTE: Electronic gaming machine (EGM) is a generic term that covers any gambling device that contains an electronic component: video draw poker, electronic keno, electronic roulette etc. In the context of the AIPC Report and this review, EGMs refer specifically to traditional 'poker machines.'

gamblers and influence their pattern of gaming, affect the play of recreational gamblers, and/or contribute to the transition from recreational to problem gambling.

From a methodological perspective, it is theoretically possible to map out the differential rates of play for specific EGMs between problem and recreational gamblers. This would be achieved through statistical analyses, calculating significant differences in the relative proportion of problem as compared to recreational gamblers displaying a preference for selecting and playing EGMs with certain features. However, to do so would require that the research meet the following conditions, namely that:

- Problem gamblers could be identified effectively and accurately;
- Recreational gamblers could be identified effectively and accurately;
- Problem gamblers show a consistent tendency to spend more time and/or money playing certain machines compared to other machines;
- Problem and recreational gamblers have stable patterns of preference for machines over time;
- The number and type of machine games in each venue remain fixed over the index measurement period;
- The number of "premium" high rollers (not meeting criteria for problem gambling) per venue could be effectively estimated; and
- Revenue is an accurate or reliable indicator of which games problem gamblers play.

However, investigating the question of a causal relationship between specific features and their impact on player behaviour and transition to patterns of problem gambling behaviour is not possible through a cross-sectional design employed by the authors of the Report. At the basic level, such an investigation should be carried out in a longitudinal design that includes gambling participants selected from a random sample of representative venues and assesses over at least two time-frames to determine changes in patterns of play between recreational and problem gamblers caused by specified EGM features.

The cross-sectional methodology used in the report is insufficient to support the assumptions posited by the authors and, therefore, the report fails to provide a substantive answer to the research questions.

Identification and classification of problem versus recreational gamblers

A primary assumption of the report is that it is possible to quantify the number and/or proportion of problem gamblers in a gaming venue and to correlate this differential proportion with certain machine features. The report also assumes that these findings will be constant and, therefore, can be generalized to other venues, irrespective of differences in socio-economic demographics and other factors.

Studies have utilized a wide variety of approaches in attempting to estimate the proportion of problem gamblers who patronize venues. Those approaches range from surveying patrons for self-reported problem gambling to estimating the number of potential problem gamblers based on findings of studies in other jurisdictions using a

variety of diagnostic instruments. Complicating the field is the lack of consensus and variable operational terms and criteria to define the boundaries of "problem", "pathological", "recreational" and "non-problem" gamblers (Blaszczynski & Nower, 2006). To date, there is little agreement in the gambling studies field regarding the classification of sub-clinical groups of gamblers who fail to meet the diagnostic threshold for pathological gambling. Studies have established arbitrary cut-offs that utilize the presence of any diagnostic symptoms (Blanco et al., 2006), symptom counts that approach the clinical threshold (Nower, Derevensky, & Gupta, 2004), combinations of clinical symptoms and amount spent gambling on gambling (National Opinion Research Center, 1999; Williams & Wood, 2004a), and other variations (National Research Council, 1999).

In the quantitative and qualitative studies in the current Report, the authors adopt classification schemes that appear arbitrary and lack empirical foundation. In the telephone survey, the authors label as "regular" gamblers anyone who reports gambling "once a fortnight" (p. 69), but posit no basis in the literature for this classification. Since the term "regular" suggests a habitual, repetitive pattern, and it is unlikely that individuals would qualify for this distinction if they visited venues barely twice in a month. The survey results indicate that about half of the participants (48.3%) gambled only twice a fortnight and only 93 participants gambled once a week (35.6%) or more (16.1%); the latter criteria (once a week or more) have been used in prior studies to denote regular gamblers (Nower, Derevensky, & Gupta, 2004; Welte et al., 2002). In addition, within the group of those who gambled once a fortnight, the researchers grouped participants who were at moderate and high risk for problem gambling according to the CPGI as "problem gamblers," without, once again, positing a clear rationale for the classification, based either on precedent in the literature or statistical cut-off scores or other findings that would clearly indicate these individuals are characteristics of problem gamblers in previous studies cited in the report.

More troubling, the report fails to conduct a direct assessment of the number of problem gamblers per venue. The authors assume without substantiation that the patronage of each venue is essentially identical, with a set proportion of problem gamblers existing in each of the venue, though there is, once again, no empirical evidence to support this assumption.

Furthermore, the survey of gamblers included in the Report was hampered by severe methodological limitations. First, it was conducted by telephone, which, in addition to failing to provide any venue-specific information about players, is also limited to a self-selected and highly-skewed demographic of individuals with land-line telephones who are amenable to participation in randomly accessed surveys. In addition, of the small sample of participants (N=180), nearly 80% were middle-aged (ages 55 to 65, 26.1%) or older adults (ages 65 to 95, 41.1%) and over half were retired (53.3%). In addition, 52.8% of participants earned less than $25,000 a year. This sample is clearly non-representative of gamblers, regular or non-regular, described in other telephone prevalence surveys (National Opinion Research Center, 1999; Productivity Commission, 1999).

In addition, the logistic regression analyses (p. 90) on which the authors rely for a number of their conclusions, demonstrate a high probability for statistical error. Among significant predictors of problem gamblers, variables such as "spending $51+," "often" or "always" spending all their money, and "playing 4-7 times per week," for example, have reported confidence intervals (CIs) that are quite wide. The CI represents the range of values with a specified probability of including the true value of the variable; great variation between the upper and lower-bound intervals indicates that the sample was likely too small for adequate statistical power and that the effect sizes were imprecise. In addition, only 28.3% of participants in the survey reported they had played any of the four games highlighted by the authors as most popular, and nearly a third of the sample (29.4%) reported they had no favorite machine. Given these and additional limitations of this study, the results could not be used to reliably identify recreational versus problem gamblers, to evaluate any differences in the attractiveness of machine features between the two groups or to provide any insight into the transition from recreational to problem gambling.

Erroneous Assumptions Regarding Machine Play

The authors devote a substantial portion of the report to speculating on the implications of revenue data on particular machines. Though requested, the data cited by the authors of the Report was not provided to us; therefore, we are unable to comment on the accuracy of the figures as presented.

We do, however, dispute several assumptions the authors made regarding the implications of the data. First, none of the data presented substantiates a supposition that problem gamblers display stable patterns of preference for specific machines because of machine features. In contrast, we would assert that, absent regulation on machine turnover, gamblers become bored with machines over time and seek novelty and innovation, as the authors also suggest by asserting that games like Dolphin Treasure are less popular in Victoria where regulation allows for greater innovation in machine technology than in South Australia where machine features are more highly regulated (p. 63). The mere fact that certain machines generate more revenue could be due to a number of factors, including: (a) a higher number of those machines in venues at a given point in time; (b) greater utilization of those machines by recreational rather than problem gamblers in a majority of venues; and/or (c) placement of those machines relative to other preferred machines or to aisles, exits, or other locations in the venue that are preferred by problem and/or pathological gamblers.

As the Report substantiates, the four popular machines (Indian Dreaming, Dolphin Treasure, Shogun and Shogun 2) are also the machines that have been most prevalent in venues in South Australia for several years. It stands to reason, then, that those machines would generate a higher proportion of revenues because they have long been familiar and dominant fixtures on the gaming floor in South Australia, not because they are inherently designed to extract more revenue from patrons than other machines.

To identify which machines, if any, are preferred by a larger percentage of problem gamblers, it would necessary to separate out "premium" high rollers who can afford high

expenditures from those who cannot and to differentiate their gambling preferences from those of recreational gamblers, assuming they could be accurately defined. It may well be that a large proportion of problem gambling revenue is accounted for by a small number of heavy gamblers on high denomination machines while low denomination machines are played by more recreational gamblers, leading to an overall higher mean NGR. Average revenue per machine is determined by a complex set of factors, including number of similar machines per venue, machine change-over rates, placement of specific machines within venues, and rates of recreational and problem gamblers attending such venues. Gamblers may sample a range of machines before settling on one that they believe is 'hot'. If there is a greater proportion of one type of machine in a venue (e.g., Indian Dreaming), then there is a greater chance that recreational gamblers will select Indian Dreaming for continued play. The same applies for varied denomination machines: Average revenue per machine will differ if there is a disproportionate number of low compared to high denomination machines per venue.

The authors also fail to advance any substantive evidence to support the claim that revenue is an accurate or reliable indicator of the games preferred by problem gamblers. Figures vary considerably from 15% to 41% depending on jurisdiction and usually refer to aggregate gambling data, not specifically electronic gaming machines (Abbott & Volberg, 2000; Lesieur, 1998; National Opinion Research Center, 1999; Productivity Commission, 1999). Therefore, any attempt to attribute the proportion of problem gamblers to a particular type of machine would require the researcher to tease out the relative proportion for each form of gambling – a task that would be difficult if not impossible given that a majority of problem gamblers have been found to gamble on a variety of games. For example, a study of self-excluded patrons from casinos in Missouri found that 54.2% of men and 27.1% of women engaged in mixed forms of play on several strategic (e.g. cards) and non-strategic (e.g. EGMs) games (Nower & Blaszczynski, 2006).

Expenditure by Problem Gamblers

We also have serious concerns regarding the accuracy and reliability of estimates of gambling expenditure by problem gamblers. A number of studies have noted significant differences between self-reported expenditures and actual reported gaming revenues. Volberg and colleagues (1998) found that gamblers in Washington State reported losses that were 2- to 10-times higher than government revenues from gambling; similar losses reported in Canada that were 2.1 times higher than actual provincial gaming revenues (Williams & Wood, 2004a). A national survey in the U.S.A. (National Opinion Research Center, 1999) and an Ontario survey in Canada (Wiebe et al., 2001) noted similar findings, though studies in Australia and New Zealand found reported expenditures to be one-half to three-fourths of actual reported revenues (Abbott & Volberg, 2000; Productivity Commission, 1999).

One reasons for these discrepancies is the use of varying methodologies to obtain estimates of expenditures from population surveys. In a recent Canadian study, Williams and Wood (2004a) estimated that 23.1% of the revenue in Canada was derived from problem gamblers. They arrived at this proportion by combining the average, self-

reported expenditure on all games from a series of provincial prevalence studies, multiplying them by 12, combining them with the estimated expenditure by nonproblem gamblers in the province, then computing the percentage of the combined amount accounted for by the total expenditures by problem gamblers.

Unfortunately, the prevalence studies utilized in the study were conducted over a five year period and variously utilized the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987) and the Canadian Problem Gambling Index (CPGI) (Ferris and Wynne, 2001) for estimating rates of problem gambling. As noted by the Williams and Wood (2004a), the SOGS was based on the earliest and currently outdated version of the American Psychiatric Association's diagnostic criteria and has been found to overestimate the prevalence rate of problem gambling by generating a significant proportion of false-positives (Abbott & Volberg, 1996; Ladouceur et al., 2000; Shaffer, Hall & Vanderbilt, 1997). In contrast, the CPGI was developed exclusively as a general population survey tool within a Canadian context (Ferris & Wynne, 2001) and adopts a very different approach to classification of gambling problems. Critics have asserted that the CPGI, like the SOGS, lacks a theoretical framework (Stinchfield, 2001) and, likewise, generates a high rate of false positives (SA Centre for Economic Studies, 2005). Therefore, any comparisons of prevalence rates and extrapolations therefrom would be methodologically unsupportable and empirically misleading.

In addition, a number of studies have established that problem gamblers misreport their gambling expenditures for a variety of reasons. First, gamblers may attach different interpretations to questions and, therefore, render the data unreliable. When Blaszczynski, Dumlao, & Lange (1997) administered a series of gambling vignettes and asked a group of students to calculate: "How much [did] you spend gambling?" for each vignette, only 32% to 64% interpreted the question to mean net expenditure versus initial or total outlay (initial plus reinvestment of winnings). In addition, questions like those in the current report, which ask for the average amount spent per session, are further confounded by the fact that respondents may interpret the question to mean their modal expenditure (i.e. usual or customary) rather than their mean expenditure, which accounts for losses and wins over time (Blaszczynski et al., 1997). These findings were not only replicated in more recent studies but also found to persist despite clear instructions given to subjects on how to calculate net expenditure (Blaszczynski, Ladouceur, Goulet, & Savard, 2006). As noted by Williams and Wood (2004b), respondents are also highly influenced by social desirability bias, the desire to exaggerate or underreport wins and losses to convey the impression they are "winners" or "high rollers," by imprecise wording, and by reliance on fallible and, often, selective memory (Toneatto, 1999; Toneatto et al., 1997).

Williams and Wood (2004b) sought to test the reliability of retrospective expenditure reports in a study of 2,528 Canadian adults who were administered one of 12 different versions of a question that asked about past month gambling expenditure as well as reliability question added to the CPGI and a prospective diary. They found that only 37.3% of respondents passed the reliability question, endorsing that their yearly spending was at least two-thirds of what they had reported it to be five minutes earlier. Those individuals who were deemed unreliable tended to report larger losses than other

gamblers. In addition, there was little correlation between retrospective estimates of expenditures and subsequent amounts obtained by prospective diaries, which tended to provide a more accurate picture of actual expenditures, a finding also replicated independently by (Blaszczynski, Ladouceur, Goulet, & Savard, under review). In addition, very few retrospective estimates came close to matching actual revenues. The authors concluded that "[i]t seems clear that most people either do not keep track of gambling expenditure, have a difficult time in quickly tabulating it, or else consider this such sensitive information that they distort the true figures" (p41).

As in the Williams and Wood study, the Productivity Commission (1999) attempted to estimate the proportion of revenue contributed by problem gamblers by utilizing a mathematical computation based on the aggregate gambling expenditure of regular gamblers grouped by SOGS scores. Though aggregated data may be theoretically useful for policy discussions, such data cannot be considered to suggest that the same proportion of expenditure by problem gamblers is to be found for each type of machine or that high revenue-generating machines have the highest proportion of problem gamblers playing them. As with other estimates of revenue from problem gambling, the Productivity Commission figure is simply an aggregate estimate based on retrospective reports from gamblers across a sample of venues more than eight years ago rather than an exact percentage of actual expenditures in specific venues by gamblers who meet clinical criteria for disorder in the current gambling climate. It cannot be used as an *a priori* statistical basis for current conclusions regarding problem gamblers in South Australia.

Qualitative data

Qualitative data was elicited from a sample of 64 problem gamblers in contact with Break Even treatment services. Notably, these were self-reported problem gamblers; no valid and reliable measures were used to confirm their gambling status or severity. Responses from these participants were accepted at face value as offering strong support for many aspects of the published literature on EGM structural characteristics; particularly the popularity of 'free spin' features (Blaszczynski, Sharpe, & Walker, 2001). However, before it can be concluded that these features are both preferred by problem gamblers and found to contribute to the transition to problem gambling, it must be established that features: (a) are not preferred equally by recreational gamblers; and (b) that they play a causal role in modifying preferences.

Setting aside the non-representative nature of the problem gambling sample under study (50% older than 48 years), the Report fails to include a sample of recreational gamblers to determine if the responses of the respondents are different from those of recreational gamblers. Therefore, it cannot be stated that the attractive features reported by problem gamblers would not also prove equally attractive to recreational gamblers. What conclusions could be reached if both sets of gamblers equally reported an attraction to free spins? It would mean that some factors independent of reported features were causally related to excessive play on specific machines. Do these features play a causal role in modifying preferences? This can only be established using a prospective or longitudinal design that demonstrates that adding one or a set of defined features to a

machine will differentially increase the proportion of problem gambling or will be differentially selected for play by more problem gamblers.

EGMs are popular, in part, because they contain certain basic core technology that is attractive to players: a machine containing mechanical or video display reels that spin on the push of a handle or button, whose outcome is determined randomly resulting in a random ratio schedule of reinforcement. Although the first gambling machine, featuring postcard faces and payouts based on poker hands, was developed in Brooklyn in 1891 by Sittman and Pitt, Charles Frey introduced the simpler 'Liberty Bell' machine in San Francisco around 1899. This machine, the forerunner of current versions, had 3 spinning reels featuring 5 symbols: diamonds, hearts, spades, horseshoes and a Liberty Bell. These machines proved popular since their inception.

Since then, technological advances witnessed the introduction of electro-mechanical (early 1960s) and electronic devices (1980s) containing additional features increasing the attractiveness and ease of use of machines: bill acceptors, multi-games, multi-line multi-coin, free spins, and double-up buttons, ticket-in-ticket out, loyalty cards, and improved graphics and physical design. These supplementary features can be considered as additional features to the core elements of a machine that act to enhance a machines appeal to a player.

Though EGMs in national and international jurisdictions differ in the design features that they contain, all have been associated with problem gambling. One can interpret this to suggest that there is some inherent characteristics of machines (e.g., random ratio schedules of reinforcement, continuous rapid play) that attract people to play. Why a proportion of players gamble to excess may be related to player-machine interactions: excitement resulting in states of dissociation that promote gambling as an emotional escape, erroneous cognitions that lead players to overestimate probabilities of winning, or neurochemical dysregulation that increase sensitivities to rewards [see Blaszczynski & Nower (2007) for an overview of causal theories of pathological gambling].

Other supplementary features are neither necessary nor sufficient in attracting problem as compared to recreational gamblers, or in transitioning recreational to problem gambling behaviours. The Report does not address the possibility that preferences expressed by participants were either generic to all EGMs (not to any particular feature) or that the features did not contribute to the transition from recreational to problem gambling. As noted in the Report, *"A risk factor for excessive gambling identified by problem gamblers was an 'unthinking' mode of EGM gambling consumption often termed the 'zone' "* (p.13). This suggests as, noted above, that factors independent of specific features, for example, states of dissociation promoting emotional escapism, are common to all EGM play and represent a core element in reinforcing persistence in play. The mere fact that a feature may be more attractive to a subgroup of gamblers does not mean that it contributes to excessive gambling behaviour. Rather, one or more factors generic to all machines may prove central to the mechanisms underlying problem gambling.

Finally, there is another confounding variable that the authors identify but do not describe in detail: the technique used in being 'reflexive' in reaching their conclusions in regard to qualitative data obtained. The Report recognizes the potential bias in the response of participants induced by the fact that they were currently in treatment. Cognitive behaviour therapy is widely used as the empirically validated treatment of choice by counselors and clinicians. One component of cognitive therapy is the correction of erroneous beliefs related to the operation of gaming machines and concepts of randomness and probabilities. In this context, problem gamblers receiving treatment would be exposed to information describing features of gaming machines that are putatively considered by clinicians to play a role in the maintenance and persistence of problem gambling behaviours. As the Report notes, there is a real prospect that participants may be reflecting preferences that were influenced by information obtained in sessions ("*…overwriting their own beliefs…"* p.97) and reported to the researchers. Thus it becomes imperative to exclude demand characteristics, that is, giving responses that the respondent believes the researcher is seeking, before one can interpret the qualitative data validly and reliably. To control for this confounding variable requires the inclusion and comparison of responses given by one sample of non-treated problem gamblers and another sample of treated problem gamblers. The Report, however, addresses this by reference to the researchers taking steps to be '*reflexive'* and "*…endeavouring to step past this 'reformed' knowledge of the facts about EGM gambling…" p. 97).* The researchers, therefore, acknowledge that rater biases were immediately introduced in the analysis of responses. Given the diversity in the way in which relevant data emerged from the qualitative interview cases, and the researchers being "*…firmly of the view that the consumption of EGM gambling is a highly socially and spatially contextualized phenomenon…" (p. 98),* it is important to ascertain the extent to which researcher bias was introduced in the qualitative analyses before accepting the validity of the conclusions at face value.

In summary, the findings based on the qualitative data cannot be considered robust and/or valid given the non-representative nature of the sample selected, lack of comparison groups of non-treated problem and recreational gamblers, the confounding influence of treatment overwriting prior beliefs (as acknowledged by the Report) and the related matter of demand characteristics and potential subtle biases in qualitative analyses.

CONCLUSIONS

Although it is theoretically possible to answer the IGA's research questions with a carefully-crafted longitudinal design, both the quantitative and qualitative studies referenced in this Report suffer from a number of serious methodological limitations and faulty assumptions that render the findings unpersuasive. Using self-reported data from a small, highly-skewed, cross-sectional convenience sample of participants, uncharacteristically classified as "regular" gamblers, in combination with aggregated revenue data from machines in South Australia, is insufficient to support any conclusions about machine gambling preferences and/or the differences in those preferences across levels of problem gambling severity. Similarly, attempting to identify machine features that are disproportionately attractive to and predictive of problem gamblers from a small, non-representative subset of treatment-seeking gamblers is likewise problematic. For

those reasons, the Report fails to adequately address or answer any of the research questions that were the subject of this inquiry.

References

Abbott, M.W. & Volberg, R.A. (1996). The New Zealand National Survey of problem and pathological gambling. *Journal of Gambling Studies*, *12*, 143-160.

Abbott, M.W. & Volberg, R.A. (2000). *Taking the pulse on gambling and problem gambling in New Zealand: A report on Phase One of the 1999 national prevalence survey.* New Zealand: Department of Internal Affairs, Government of New Zealand.

Blanco, C., Hasin, D.S., Petry, N., Stinson, F.S., & Grant, B.F. (2006). Sex differences in subclinical and DSM-IV pathological gambling: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychological Medicine, 36*, 943-953.

Blaszczynski, A., Dumlao, V., & Lange, M. (1997). How much do you spend gambling? Ambiguities in survey questionnaire items. *Journal of Gambling Studies, 13*, 237-252.

Blaszczynski, A., Ladouceur, R., Goulet, A., & Savard, C. (2006). How much do you spend gambling? Ambiguities and inaccuracies of data derived from this question. *International Gambling Studies, 6*, 123-128.

Blaszczynski, A., Ladouceur, R., Goulet, A., & Savard, C. Retrospective and prospective evaluations of money spent on gambling and calculation strategies. Under review, *Journal of Gambling Issues.*

Blaszczynski, A. & Nower, L. (2006) Gambling and impulse control disorders. In M. Hersen, & J.C. Thomas (eds.), *Comprehensive handbook of personality and psychopathology, Volume 2: Adult psychopathology*. New York: John Wiley & Sons, pp. 370-388.

Blaszczynski, A. & Nower, L. (2007). Etiological processes. In G. Smith, D. Hodgins, & R. Williams (eds.). *Research and measurement issues in gambling studies*. Elsevier: Toronto. Pp.317-338.

Blaszczynski, A., Sharpe, L., & Walker, M. (2001). *Final report: The assessment of the impact of the reconfiguration on electronic gaming machines as harm minimization strategies for problem gambling*. Report to the Gaming Industry Operators Group. Sydney: Authors.

Ferris, J. & Wynne, H. (2001). *The Canadian Problem Gambling Index Final Report.* Report to the Canadian Centre on Substance Abuse. Ottawa, Ontario: CCSA.

Ladouceur, R., Bouchard, C., Rheaume, N., Jacques, C., Ferland, F., Leblond, J., & Walker, M. (2000). Is the SOGS an accurate measure of pathological gambling among children, adolescents and adults? *Journal of Gambling Studies, 16*, 1-24.

Lesieur, H.R. (1998). Costs and treatment of pathological gambling. *Annals of the American Academy of Political and Social Sciences, 556,* 153-171.

Lesieur, H.R., & Blume, S.B. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of pathological gamblers. *American Journal of Psychiatry, 144,* 1184-1188.

National Opinion Research Center (NORC) (1999). *Gambling impact and behavior study.* Chicago: University of Chicago.

National Research Council (1999). *Pathological gambling: A critical review.* Washington D.C.: Author.

Nower, L. & Blaszczynski, A. (2006). Characteristics and gender differences in casino self-excluders: Missouri data. *Journal of Gambling Studies, 22,* 82-99.

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

Productivity Commission (1999). *Australia's gambling industries.* Report No. 10. Canberra: Aus Info.

SA Centre for Economic Studies (2005). *Problem gambling and harm: Towards a national definition.* Report prepared for The Ministerial Council on Gambling. Victoria: Office of Gaming and Racing.

Shaffer, H.J., Hall, M.N., & Vander Bilt, J. (1997). Estimating the prevalence of disordered gambling behavior in the United States and Canada: A Meta-analysis. Cambridge: Harvard Medical School Division on Addictions.

Stinchfield, R. (2001) Reliability, validity, and classification accuracy of the South Oaks Gambling Screen (SOGS). *Addictive Behavior, 27,* 1-19.

Toneatto, T. (1999). Cognitive psychopathology of problem gambling. *Substance Use & Misuse, 34,* 1593-1604.

Toneatto, T., Blitz-Miller, T., Calderwood, K., Dragonetti, R. & Tsanos, A. (1997). Cognitive distortions in heavy gambling. *Journal of Gambling Studies, 13,* 253-267.

Volberg, R.A., Moore, W.L., Christiansen, E.M., Cummings, W.E., & Banks, S.M. (1998). Unaffordable losses: Estimating the proportion of gambling revenues derived from problem gamblers. *Gaming Law Review, 2,* 349-360.

Weibe, J., Single, E. & Falkowski0Ham, A. (2001). *Measuring Gambling and Problem Gambling in Ontario*. Report to the Canadian Centre on Substance Abuse and The Responsible Gambling Council (Ontario). Ontario: Authors.

Welte, J.W., Barnes, G.M., Wieczorek, W.F., Tidwell, M.-C., & Parker, J. (2002). Gambling participation in the U.S. – results from a national survey. *Journal of Gambling Studies*, *18*, 313-337.

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*, 33-45.

Williams, R.J. & Wood, R.T. (2004b). *The demographic sources of Ontario gaming revenue*. Final report to the Ontario Problem Gambling Research Centre.