

Problem Gambling Inside and Out: The Assessment of Community and Institutional Problem Gambling in the Canadian Correctional System

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Abstract This paper reports on the results of a multi-site survey of gambling behaviour and gambling problems amongst offenders in correctional institutions in Ontario, Canada, conducted between 2008 and 2011. A total of 422 (completion rate 61.5 %) incarcerated offenders (381 male and 41 female) took part in the study including 301 federal offenders and 121 provincial offenders. Based on the Problem Gambling Severity Index of the Canadian Problem Gambling Index (CPGI/PGSI) the prevalence rate of severe problem gambling was 8.9 prior to incarceration and 4.4 % during incarceration. These numbers are substantially higher than rates found among the general public. Thirty-four percent of the sample reported gambling in prison. Half of those who suffered from gambling problems before incarceration continued to have gambling problems during incarceration. People with problems related to slot machines prior to incarceration reported fewer gambling problems during incarceration compared to other problem gamblers.

Keywords Problem gambling · Offender · Correctional institutions · Crime · Corrections population · Gambling while incarcerated

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Introduction

In a recent study of gambling problems amongst Federal offenders in Ontario (Turner et al. 2009), 9.4 % scored in the severe problem gambler range on the Problem Gambling Severity Index of the Canadian Problem Gambling Index (CPGI/PGSI). In addition, another 15.7 % reported moderate levels of gambling problems for a total of 25.1 % suffering from some degree of gambling problem. Similar figures have been reported in correctional populations in other countries (Abbott and McKenna 2005; Abbott et al. 2005; Abbott and Volberg 1996; Anderson 1999; Bellringer 1986; Blaszczynski and Silove 1996; Lahn and Grabosky 2003; Nixon et al. 2006; Williams et al. 2005). In a review of the literature (Williams et al. 2005), the prevalence of problem gambling (combining severe and moderate gambling problems) within forensic populations ranged from 17 to 60 %, with an average of about 33 % across the samples. In contrast, studies of the general population tend to yield a prevalence estimate of around 1 % for pathological or severe problem gambling,¹ and another 2–3 % for subclinical or moderate problems (Ferris and Wynne 2001; Room et al. 1999; Rush et al. 2008; Shaffer et al. 1999; Wiebe et al. 2001, 2005). Four issues remain unresolved: (1) the amount of gambling inside the institution, (2) the prevalence of gambling problems during incarceration, (3) the prevalence of gambling problems amongst female offenders, and (4) the link between gambling and crime.

Most jurisdictions explicitly prohibit gambling within their correctional facilities (Williams et al. 2005). In Canada for example, disciplinary action can be taken against offenders who are caught gambling or who possess personal items acquired through gambling. Nonetheless, those few studies that have examined gambling within correctional institutions report that gambling is common in these institutions (Williams 2009; Williams et al. 2005).

Little is known about problem gambling within correctional institutions. Previous studies have often focused on lifetime measures or only asked about gambling problems prior to incarceration (Williams et al. 2005). Other studies have only included recently sentenced offenders (Turner et al. 2009). In the current study, we examined problem gambling both before and during incarceration.

Few studies have examined gambling among female offenders. In non-offender samples, females are somewhat less likely than males to gamble (Wiebe et al. 2001, 2005) or develop gambling problems (Urbanoski and Rush 2006). In addition, females often report gambling as an escape from their difficulties and are less likely to identify it as a competitive activity (Petry et al. 2005). Although a majority of problem gamblers in treatment are male, slot machines attract equal numbers of male and female problem gamblers (Petry et al. 2005; Turner et al. 2005). Based on the literature that does exist, Williams et al. (2005) indicate that female offenders typically have lower rates of gambling problems compared to male offenders (11 vs. 33 %). Nonetheless, those rates are substantially higher than those found among females in the general public (Wiebe et al. 2001, 2005). Currently, no data is available on gambling or problem gambling among female offenders in Canada.

There are a number of additional issues about the relationship of gambling and crime that have not been fully resolved. According to some studies (Blaszczynski et al. 1989; Sakurai and Smith 2003; Williams et al. 2005) severe problem gambling is most often related to income producing offences such as larceny and embezzlement. According to

¹ Different researchers have used different labels. Pathological, probable pathological and severe problems are all intended to indicate the most severely disordered gamblers. Subclinical and moderate problem gamblers refer to those gamblers who fall just short of a clinical diagnosis.

Turner et al. (2009), 65 % of the offenders who had a severe gambling problem, reported that their gambling lead to at least some of their criminal behaviour. In contrast very few moderate or non-problem gamblers reported that gambling lead to their criminal behaviour. In addition, Turner et al. (2009) found that severity of problem gambling was related to the number of income producing offences committed by the offenders, but was not correlated with the number of violent offences. It is important to note however, that in their sample most of the severe problem gamblers had also committed violent offences. Turner et al.'s study was conducted in a federal prison. In Canada, offenders are sentenced to federal prison for more serious (e.g., violent) offences. Offenders who have committed less serious offences are sent to a provincial prison rather than a federal prison. In order to better understand the relationship between crime and problem gambling, we included both federal prisons and provincial prisons in the present study. In addition, within the federal system offenders are streamed into minimum, medium, maximum security depending on their security risk. If severe problem gamblers commit non-violent crimes in desperation to pay off gambling debts, they should be less violent and more obedient offenders who would be classed as low risk and thus end up in minimum security institutions. On the other hand, if problem gambling within the correctional system are just simply impulsive by nature, they may engage in other impulsive acts (e.g., disobeying officers, fights, drug use) and end up at a higher level of security.

The present study was designed as a comprehensive inquiry into problem gambling in the correctional system in Ontario, Canada. Based on previous research, the following were hypothesized:

1. Prevalence rates of moderate and severe problem gambling will be significantly higher than in the general population.
2. Prevalence rates of moderate and severe problem gambling while incarcerated will be significantly higher than in the general population.
3. Problem gambling severity scores prior to incarceration will be significantly correlated with gambling problem severity during incarceration.
4. Problem gambling severity will be correlated with number of income producing crimes, but not with number of violent crime.
5. Severe problem gamblers will report that their criminal behaviour was a result of their gambling, more often than moderate and non-problem gamblers.
6. If problem gamblers mostly commit income producing crimes rather than violent crimes, problem gambling should be more common in provincial prisons and in lower security prisons.

Method

Participants

In total 422 offenders took part in the study including 301 federal offenders (281 males and 20 females) and 121 provincial offenders (100 males and 21 females). In Canada, a federal offence is defined as a custodial sentence of two years or more. Offenders sentenced to less than 2 years are housed in separate provincial facilities. Participants were drawn from 3 provincial institutions and 7 federal institutions. The institutions selected provided us with a comprehensive overview of the types of correctional facilities in Southern Ontario. Federal institutions included all three security levels (minimum, medium, maximum) of the

Correctional Service of Canada (CSC). Information about the study was presented to 686 offenders. Of these, 422 completed the questionnaires (completion rate of 61.5 %) and 357 consented to file review (completion rate of 52 %). Of these offenders, 104 were interviewed in more depth about their gambling and criminal history.

Measures

The package of questionnaires was largely the same as that used in Turner et al. 2009 which included measures of gambling behavior and gambling problems. To measure gambling behaviour we used a gambling behavior questionnaire that asked the participants about frequency and the amount wagered for 17 different forms of gambling (Turner et al. 2006, 2008, 2009). Two different versions of the gambling activities questions were used with one oriented to gambling in the 12 months prior to incarceration and the other oriented to gambling during current incarceration. The gambling activities questionnaires asked the respondents how often they gambled (e.g. once a week, once a month), and the amounts they typically would bring to a gambling session for the purpose of wagering (not amount spent or lost). This method avoids the ambiguity in spending caused by the occasional wins and measures how seriously they are involved in gambling by how much they are willing to risk.

Problem gambling was assessed using three measures: (1) the SOGS which has been shown to be a valid and reliable instrument for assessing pathological gambling (Lesieur and Blume 1987, 1993), (2) the DSM-IV-TR criteria for pathological gambling (American Psychiatric Association 2000) which was used as a self-report scale ($\alpha = 0.87$; Turner et al. 2006, 2008, 2009), (3) and the CPGI/PGSI (Ferris and Wynne 2001) which categorizes people into severe, moderate, low risk, or non-problem gamblers. Three measures were utilized in order to determine the consistency of these measures within a fairly unique and specialized population. As with the gambling frequency questionnaire, all three measures were framed using two distinct time periods: “12 months prior to incarceration” and “during the current period of incarceration”.

Information about the offenders’ criminal history was obtained from an examination of their institutional files. Offences were grouped into three categories: (1) income producing crimes such as theft or break and enter, (2) violent crimes such as assault and murder, and (3) other crimes that were neither violent nor income producing in nature such as driving under the influence, vandalism, or breaches of conditions. Robbery was classified as both violent and income producing. In addition we examined the number and type of institutional charges listed in the file for each offender.

Procedure and Design

Participants were randomly selected from a master list of offenders and asked to attend an information session. This was supplemented by posting an advertisement about the study on offender bulletin boards and explaining the purpose of the study to offender representatives within the institution (“committee reps”) in order to avoid any misunderstandings about the intent of the study. Small groups of offenders were assembled, the study was described to them by the two research analysts, and volunteers were then solicited. Those who volunteered for the study signed a consent form indicating their willingness to participate. Consenting participants completed the questionnaires in small groups of approximately 6–10.

In addition, a check box on the consent form asked the offenders for consent to a review of their correctional files to verify demographic data, criminal history information, mental health indices, and institutional changes.

One hundred and four offenders were interviewed in more depth about their gambling and gambling problems: 25 severe problem gamblers, 25 moderate problem gamblers, and 54 non-problem gamblers. In the interview, offenders were asked additional questions about their gambling behavior, particularly as it related to their criminal histories, in an attempt to determine if there was a relationship between their criminal behavior and problem gambling. A semi-structured interview format was used. The interview results were coded based on their literal meaning, and the results were then analyzed statistically. The coder was blind to the problem status of the offender.

Preliminary analyses for this study were conducted using SPSS 15.1. However, because the samples were collected at 10 different institutions, the sample of the data is nested within institutions (a cluster sample). This cluster sampling can increase the error variance. As a result, the standard errors for prevalence and problem gambling scores were analyzed using AM 0.06.04 (Cohen 2005) which computes robust estimates for standard errors which are typically larger than the standard errors for a true random sample. The AM estimates were generally similar to those computed using SPSS 15.1. However, the level of significance was often lower. For correlations, the significance was tested using the AM regression procedure. All confidence interval were 95 %.

Results

Table 1 depicts the composition of the sample with regard to various demographic, sentencing, and socio-economic characteristics. Overall, 90.6 % of the sample was male and 9.4 % was female, with 72.2 % being federal offenders and the remaining 27.8 % being provincially incarcerated. Nationally, provincial offenders make up 67.8 % of offenders who are incarcerated in a given year. In order to accurately measure gambling problems in each type of institution we set as a target sample 100 offenders in provincial, federal minimum security, federal medium security, and federal maximum security. The distribution of federal offenders across the 3 levels of CSC institutional security was as follows: 20.2 % maximum, 23.4 % medium, and 24.0 % minimum security. In addition, females were oversampled (9.4 %). Nationally, females make up 6.5 % of the offender population in Canada (Bourgon 2009). The ethnic distribution (37.4 % Non-Caucasian) is quite similar to provincial statistics on ethnic background (35 %; Mangan 2009). A slight majority of the sample (51.2 %) were under the age of 40 which is close to the national statistics that reports that 56.1 % were under the age of 40 (Bourgon 2009).

Prevalence of Problem Gambling

To test hypothesis 1 we computed the prevalence of severe problem gambling in the offenders, using three measures: the CPGI/PGSI, DSM-IV, and SOGS. The use of multiple measures allows us to check on the psychometric properties of the three and determine the accuracy of measurement. The correlations between the three scores were all highly significant, ranging from 0.77 to 0.86. Table 2 presents the reliability statistics, the estimated prevalence, and 95 % confidence intervals for each of the three measures of problem gambling. According to the SOGS, 13.4 % of the sample scored as probable pathological gamblers (score ≥ 5 on SOGS) and another 4.8 % scored as subclinical problem gamblers

Table 1 Sample characteristics of the offenders

	Federal (n = 301)	Provincial (n = 121)	Male (n = 381)	Female (n = 41)	Total sample (n = 422)
% of total sample	71.3	28.7	90.3	9.7	100.0
Mean age	40.6	34.0	38.6	39.7	38.7
Age range	19–82	18–63	18–82	21–60	18–82
Non-Caucasian (%)	38.2	35.3	38.8	25.0	37.4
Secondary education or higher (%)	51.0	53.7 %	51.1	58.5	51.8
Employed prior to current sentence (%)	62.4	56.7	63.0	40.0	60.8
Unskilled employment (%; N = 282)	33.5	41.1	33.1	56.0	35.4
Income <\$20,000 (%)	41.1	49.1	41.9	57.9	43.4
Median sentence length in weeks	290.5	52.0	190.0	56.5	173.0
Indeterminate sentence (%)	28.5	0.0	23.0	4.2	21.6

The median sentence length was used because of the large number indeterminate (e.g., life) sentences. Indeterminate sentences were scored as 9999. Note that not all of the offenders granted permission for the file review. Consequently the sample sizes for average sentence length were n = 242 for federal, n = 78 for provincial, n = 296 for males, n = 24 for females, and n = 320 for the full sample

Table 2 Prevalence prior to and during incarceration (%) with robust confidence intervals (95 % CI)

Year prior to incarceration	DSM-IV N = 422	CPGI/PGSI N = 420	SOGS N = 419
Cronbach alpha	0.87	0.93	0.92
Non-problem	72.5 ± 9.5	60.6 ± 11.9	63.7 ± 9.8
Low problems	14.7 ± 6.3	18.0 ± 5.9	18.1 ± 3.4
Moderate/subclinical problems	5.0 ± 2.0	12.1 ± 3.4	4.8 ± 3.4
Severe problem/probable pathological	7.8 ± 2.9	8.9 ± 5.0	13.4 ± 5.0
During incarceration	N = 422	N = 412	N = 420
Cronbach alpha	0.86	0.90	0.83
Non-problem	80.1 ± 10.2	77.8 ± 10.5	79.7 ± 9.2
Low problems	12.1 ± 6.0	10.0 ± 5.0	13.4 ± 6.0
Moderate/subclinical problems	3.1 ± 1.5	7.8 ± 3.6	1.7 ± 1.3
Severe problem/probable pathological	4.7 ± 3.9	4.4 ± 2.9	5.3 ± 3.2

For headings we have used the CPGI categories. Severe problem is roughly equivalent to the DSM-IV category “pathological” or the SOGS category “probable pathological”

(score 3–4 on SOGS). The DSM-IV indicated the prevalence rate of pathological gambling (score ≥ 5) as 7.8 % with a further 5.0 % scoring in the subclinical range (score 2–4). According to the CPGI/PGSI, 8.9 % of the sample scored in the severe problem range (score ≥ 8), and 12.1 % scored in the moderate problem range (score 3–7).² Although each of these three measures provided different estimates of severe problem gambling, they

² These numbers are not weighted to correct for oversampling of Federal offenders. If weighted to correct for the over sampling of federal offenders the overall prevalence estimates would be 9.4 % (±3.4 %) pathological based on the DSM-IV-TR, 16.9 % (±5.6 %) probable pathological based on the SOGS, and 10.7 % (±3.8 %) severe problem gambler based on the PGSI/CPGI.

Table 3 Cross tabulation of the number of offenders in each CPGI/PGSI category before and during incarceration (n)

	CPGI/PGSI categories during incarceration				
	Non-problem	Low problem	Moderate problem	Severe problem	Full sample
<i>CPGI/PGSI categories prior to incarceration</i>					
Non-problem	236	9	4	2	251
Low problem	51	22	3	0	76
Moderate problem	20	6	19	3	48
Severe problem	11	4	6	12	33
Full sample	318	41	32	17	408

were all substantially and significantly higher than what would be expected in the general population (1.14 % CI ± 0.24 ; Shaffer et al. 1999).

The same measures were also slightly modified to assess the prevalence of gambling pathology in the offenders during their incarceration. The correlations between the pre-incarceration and incarceration problems were $r = 0.56$ for the DSM-IV, $r = 0.55$ for the CPGI/PGSI and $r = 0.50$ for the SOGS thus supporting hypothesis 3. According to the SOGS, during incarceration 5.3 % of the sample scored as probable pathological gamblers and another 1.7 % scored as subclinical problem gamblers (see Table 2). The DSM-IV indicated the prevalence rate of pathological gambling during incarceration was 4.7 % with a further 3.1 % scoring in the subclinical range. According to the CPGI/PGSI, 4.4 % of the sample scored in the severe problem range, and 7.8 % scored in the moderate problem range. Again, while each measure provided a different prevalence estimate, all were significantly higher than would be expected in the general population.

An analysis of changes in problem gambling measures using log scores (transformed using $\log_{10} + 1$ due to skewness of the measures) indicated that all three of the indicators for problem gambling (CPGI/PGSI, $t(8) = 6.4$,³ $p < .001$, DSM-IV, $t(8) = 3.1$, $p < .05$, SOGS, $t(8) = 5.8$, $p < .001$) showed a significant decrease in problem gambling scores during incarceration compared to before incarceration. As shown in Table 3, only 2 offenders reported being non-problem gamblers prior to incarceration but severe problem gamblers while in prison. Another seven individuals reported having either low or no problem prior to incarceration, but having moderate problems during incarceration. In contrast 15 offenders went from having a severe problem before incarceration to scoring in the non-problem or low levels of problems during incarceration, and 26 offenders went from moderate to non-problem or low problems. In summary, the data shown in Table 3 indicates that 9.8 % of the sample reported having a moderate or severe problem both before and during incarceration, 10.0 % of the sample reported having a problem before incarceration, but not during incarceration, and 2.2 % reported not having a problem prior to incarceration but developing one during incarceration.

Sex Differences in Problem Gambling Scores

In Table 4, the percentages are broken down in terms of sex and time frame (before vs. during incarceration). The most interesting aspect of these figures is that females had

³ Degrees of freedom for t test and ANOVA are related to the number of institutions from which the data was drawn.

Table 4 CPGI Prevalence estimates (%) and standard errors (SE) before and during current incarceration

	N	Non-problem		Low problems		Moderate problems		Severe problems	
		%	SE	%	SE	%	SE	%	SE
Year prior to incarceration									
<i>Sex</i>									
Male	379	62.0	6.7	17.7	3.2	12.1	2.2	8.2	2.0
Female	41	46.3	5.7	26.8	4.3	12.2	1.9	14.6	0.5
<i>Institution type</i>									
Federal	300	68.7	4.3	14.0	1.7	10.0	1.8	7.3	1.9
Provincial	120	40.0	1.0	30.0	3.0	17.5	0.7	12.5	1.6
<i>Security level (federal only)</i>									
Min	103	78.6	7.0	9.7	2.2	6.8	1.3	4.9	4.1
Med	96	66.7	1.1	16.7	1.1	9.4	0.2	7.3	2.0
Max	81	61.7	1.5	14.8	3.1	14.8	2.7	8.6	1.9
During current incarceration									
<i>Sex</i>									
Male	373	75.9	5.7	11.3	2.7	8.0	2.0	4.8	1.6
Female	39	92.3	5.5	2.6	1.8	5.1	3.6	0.0	0.0
<i>Institution type</i>									
Federal	296	80.1	5.7	8.8	2.5	7.4	2.2	3.7	1.7
Provincial	116	70.7	7.9	14.7	3.3	8.6	2.9	6.0	2.0
<i>Security level (federal only)</i>									
Min	101	92.1	3.3	5.9	1.8	2.0	1.7	0.0	0.0
Med	95	83.2	2.6	4.2	0.2	8.4	2.1	4.2	0.2
Max	80	60.0	1.6	18.8	5.2	12.5	1.7	8.7	2.0

higher levels of problems than males prior to incarceration but a lower level of problems during incarceration. Analysis of changes in scores computed by subtracting incarceration scores from pre-incarceration scores revealed significant sex differences in changes to the CPGI/PGSI scores, $t(7) = -5.1$, $p < .001$, and SOGS scores, $t(7) = -4.3$, $p < .01$, indicating that the change from pre-incarceration to incarceration was larger for females than for males. The difference did not reach significance for the DSM-IV scores, $t(7) = -1.2$, ns. During the interviews some of the females provided anecdotal explanations for the lower rates of female gambling. According to one woman, betting on games during incarceration was not popular among the female offenders, thus there were few opportunities to gamble inside. Secondly, we were told that the women occupied themselves primarily with productive social activities such as education, rehabilitative programs, and institutional employment.

Provincial Versus Federal

Table 4 also presents the prevalence rates for provincial and federal correctional settings. Overall, these numbers suggest that problem gambling is more common among provincial offenders and that this difference existed prior to incarceration. Analysis of log transformed scores found significant differences between Federal and Provincial institutions

prior to incarceration for the CPGI/PGSI $t(8) = -4.1, p < .01$, the DSM-IV $t(8) = -3.4, p < .01$, and the SOGS, $t(8) = -3.1, p < .05$. In each case the provincial log mean was significantly higher. The differences between provincial and federal correctional setting for gambling during incarceration did not reach significance.

Problem Gambling by Security Level

As shown in Table 4, the higher the security level, the more problem gambling was reported. Offenders in minimum security were less likely to report gambling problems prior to incarceration (5.8 %) compared to those in maximum security (11.4 %). Similarly, during incarceration, none of the offenders in minimum security reported a gambling problem whereas 10.0 % of the offenders in federal maximum security reported having a gambling problem while incarcerated. The correlation of security level (federal only) and problem gambling prior to incarceration only did not reach significance. However, it was significant for all three measures during incarceration (SOGS, $r = 0.29, p < .01$; DSM-IV, $r = 0.27, p < .01$; CPGI/PGSI, $r = 0.31, p < .001$). Based on anecdotal reports, some⁴ of the offenders in low security levels told us that they were less interested in gambling because they felt that they had more to lose if caught gambling.

Gambling Activities

For gambling activities, we asked participants to report the frequency in which they participated in 17 types of games in terms of the “last 12 months on the street” (not in prison). In total 71.7 % of the offenders reported gambling on at least one form of gambling in the 12 months prior to incarceration (76.0 % provincial offenders and 70.0 % of federal offenders). The participants were also asked about the frequency of their gambling inside prison and 34.0 % reported gambling on at least one game (39.7 % provincial offenders and 31.6 % federal offenders). We then computed the total frequency of gambling across game types. To aggregate the frequency data, weekly or monthly frequency was converted into days per year (e.g., once per week = 52) and this was then added together. This results in a somewhat inflated estimate because 66 games are played during the same occasion (e.g., casino slots and casino table games), but still yields an estimate of the frequency of the participant’s involvement in gambling relative to other participants. The mean number of gambling days was 161.1 (SD = 395.5) and the median number was 26.0. Non-gamblers made up 27.2 % of the sample. For severe problem gamblers (using the CPGI/PGSI categories) the median number of gambling days was 389, for moderate problem gamblers the median was 168, for low problem gamblers the median was 104, and for the non-problem participants the median was 2. The most common games played by the offender sample prior to incarceration (see Table 5) were lotteries (45.5 %), followed by scratch tickets (37.8 %), private card games (21.3 %), slots (17.5 %), casino card games (14.5 %), bingo (14.9 %), sports lotteries (12.0 %), and games of skill (11.6 %).

In addition, each participant was asked if they had a problem related to each of the 17-types of games prior to incarceration. The percentage of moderate and severe problem gamblers who reported having a problem with each of the 17 games prior to incarceration are given in the last two columns of Table 5. Males were most likely to report having problems with private cards games, whereas females were most likely to report having

⁴ The exact number was not recorded, but about 20 of the offenders and the heads of the Inmate Committees at both minimum institutions expressed this view to us.

Table 5 Gambling participation (%) prior to incarceration and during incarceration and problems with specific games prior to incarceration (%)

Game type	Game participation		Problems with specific games prior to incarceration	
	Prior to incarceration N = 417	During incarceration n = 413	Male n = 75	Female n = 11
Lottery	45.4	1.5	12.0	9.1
Scratch tickets	37.9	0.5	16.7	27.3
Pull tabs	11.4	0.7	6.8	18.2
Private card games	21.5	27.7	31.5	9.1
Cards (Casino)	14.5	1.2	24.3	9.1
Other table Games (Casino)	7.0	0.2	10.7	9.1
Video poker (Casino)	17.5	0.0	6.7	0.0
Slots/video slots (Casino)	3.4	0.0	8.0	45.5**
Stocks/futures	2.2	0.0	4.0	0.0
Track/OTB	5.5	0.2	5.4	9.1
Sports lotteries	12.0	1.7	9.3	9.1
BINGO	15.0	1.7	9.5	9.1
Real estate	1.2	0.0	1.4	0.0
Sports betting	8.8	10.6	9.9	0.0
Internet gambling	3.8	0.7	5.3	18.2
Games of skill	11.6	4.0	12.2	10.0
Other	1.5	1.5	2.7	0.0
Any game	71.7	34.0	54.7	63.6

Column 4 and 5 indicate the percentage of moderate and severe problem gamblers who reported having a problem with each specific type of game prior to incarceration. The asterisks indicate significant sex differences

** $p < .01$

problems with slot machines. Only 8 % of the male problem gamblers reporting having problems with slot machines, but 45 % of the female problem gamblers reported having a problem with slots machines.

During incarceration the participants most often reported participation in card games (27.7 %), sports betting (10.6 %), and games of skill (4.0 %). Interestingly, rates of participation in private card games and sports betting during incarceration were actually higher than those reported for the period prior to incarceration. Of the offenders who reported a moderate or severe gambling problems prior to incarceration, 22 % reported having a problem with card games during incarceration (23 % males; 18 % females). Only males reported having problems with sports bets and games of skill.

An examination of the relationship between gambling before and during incarceration found that 67 % of the offenders who gambled prior to incarceration also reported gambling during incarceration. In contrast, only 18 % of the offenders who reported no gambling prior to incarceration reported gambling during their current sentence, $\gamma = 0.51$, $p < .001$.

As noted earlier, CPGI/PGSI scores during incarceration were substantially lower than CPGI/PGSI scores prior to incarceration. We examined game specific problems for

offenders who scored in the problem gambling range prior to incarceration to see if some games would be associated with this decrease in problems during incarceration. The only significant effect was that offenders who reported problems associated with slot machines prior to incarceration had lower CPGI/PGSI scores during incarceration, $r = -0.49$, $p < .001$. After controlling for sex, this correlation was still significant, $r_p = -0.39$,⁵ $p < .05$.

File Review Data

There were significant differences in the number of violent crimes in the different types of institutions, $F(3, 7) = 116.6$, $p < .001$. According to Bonferroni post hoc tests, minimum security offenders had committed significantly fewer violent offences ($M = 2.6$, $SD = 4.1$) than offenders in medium ($M = 6.1$, $SD = 4.7$) or maximum ($M = 6.0$, $SD = 6.7$). In addition, provincial offenders ($M = 2.6$, $SD = 4.6$) had committed significantly fewer violent offences than offenders in federal medium or maximum, but did not differ significantly from offenders in federal minimum security. There was also a weak relationship between security level and number of other crimes, $F(3, 7) = 5.3$, $p < .05$. In particular, most “other” crimes had been committed by those in maximum security. However, none of the pairwise differences between security levels reached significance. There was no significant relationship between security level and the number of income producing crimes, $F(3, 7) = 4.1$, ns.

Overall, severity of problem gambling symptoms as measured by the CPGI/PGSI was not correlated with either the number of violent, $r = -0.04$, ns, or income producing crimes, $r = -0.03$, ns. The most common offences by problem gamblers ($n = 63$) were breaches or failures to comply ($M = 4.5$, $SD = 6.7$), theft ($M = 3.4$, $SD = 9.2$), assault ($M = 1.4$, $SD = 2.2$), fraud ($M = 1.4$, $SD = 5.9$), possession of property obtained by crime ($M = 1.3$, $SD = 3.8$), and break and entry ($M = 0.95$, $SD = 2.6$). The only significant correlations between CPGI/PGSI scores prior to incarceration and offences were for the number of extortion offences, $r = 0.15$, $p < .05$, other violent crimes, $r = 0.21$, $p < .01$, and mischief, $r = 0.20$, $p < .05$.

However, the number of violent crimes $r = 0.14$, $p < .05$ was significantly correlated with gambling problems inside the institution. Change in CPGI/PGSI scores (during incarceration—prior to incarceration) was associated with the number violent crimes. That is people who had committed more violent crimes prior to incarceration were more likely to continue gambling problem gambling during incarceration compared to other offenders, $r = 0.15$, $p < .05$.

The number of major institutional charges was positively associated with higher CPGI/PGSI scores during incarceration $r = 0.33$, $p < .01$. Table 6 indicates the various types of institutional charges laid, and their association with CPGI/PGSI score prior to incarceration and during incarceration. As shown in Table 6 there are a few small correlations between institutional changes and CPGI/PGSI scores before incarceration. However, the relationship between institutional charges and CPGI/PGSI scores during incarceration was much stronger. The strongest correlations were for possession of serious contraband, $r = .34$, $p < .001$, for disrespecting an officer, $r = 0.30$, $p < .01$, possession of a weapon, $r = 0.26$, $p < .05$, fights and aggressive behavior, $r = 0.26$, $p < .05$, other minor offences, $r = 0.34$,

⁵ This partial correlation was calculated based on the output from AM for the three variables involved using a calculator found at <http://vassarstats.net/par.html>. The significance level was determined using regression analysis in AM.

Table 6 Relationship between the number of income producing crimes, violent crimes, and institutional charges and scores on the CPGI/PGSI before and during incarceration

	CPGI/PGSI before incarceration N = 292	CPGI/PGSI during incarceration N = 289
<i>Offences prior to incarceration</i>		
Income producing crimes	-0.04	0.09
Violent crimes	-0.03	0.14*
<i>Institutional charges during incarceration</i>		
Major offences		
Total number of major institutional charges	0.13	0.33**
Possession of weapon	0.01	0.26*
Fighting/assaults/aggressive behaviour.	0.12	0.26*
Drugs or alcohol.	-0.02	0.11
Possession of serious contraband	0.15*	0.34***
Disobeying officer or refusing an order	0.09	0.20*
Other serious offences	0.15*	0.26**
Minor offences		
Total number of minor institutional charges	0.07	0.30**
Smoking violations	0.02	0.15
Contraband charges	0.03	0.21*
Minor charges related to alcohol	0.01	0.19*
Disrespecting an officer (minor)	0.09	0.30**
Routine infractions.	0.00	0.16
Other minor offences	0.08	0.34**

* $p < .05$; ** $p < .01$; *** $p < .001$

$p < .01$. Interestingly, the number of major institutional charges was more strongly correlated to the severity of problem gambling while incarcerated, $r = 0.30$, $p < .05$, than it was to either the number of violent, $r = 0.18$, ns, or income producing offences, $r = 0.19$, ns, committed before incarceration.

Relationship Between Gambling and Crime

To explore the link between gambling and crime in more detail, 104 participants were interviewed about the links between gambling and their criminal history. During the interview the participants were asked if gambling problems led to their criminal activity or if their criminal activity led to gambling. Using the same method as Turner et al. (2009), responses were recorded on a note pad and later coded into one of four categories:

1. The participant reported committing crimes as a direct consequence of gambling. In most cases, the crime was committed to finance gambling or to pay gambling debts (e.g., Would loose rent money gambling and then commit crime to make it back by robbery or selling drugs).
2. The participant reported that gambling was part of their criminal lifestyle. In some cases, they were involved in illegal gambling operations as bookies, enforcers, or players. In other cases, they said their criminal activity produced ready money that

Table 7 The reported relationship of gambling and crime (%)

	Random non- problem (n = 38)	Non-problem/ non-random (n = 16)	Moderate problem (n = 25)	Severe problem (n = 25)	Total sample (n = 104)
Gambling lead to Crime	0.0	12.5	8.0	44.0	14.4
Crime lead to Gambling	2.6	37.5	28.0	12.0	16.3
Mixed or unclear	2.6	6.3	4.0	4.0	3.8
Unrelated	94.7	43.8	60.0	40.0	65.4

they could gamble with. For example one offender told us that he was introduced to gambling through criminal connections; he had lots of disposable income to gamble with from criminal activity and could always easily make it back if he lost.

3. There was an unclear or two-way relationship between crime and gambling.
4. Crime and gambling were unrelated.

As shown in Table 7, most of the sample (65.4 %) reported that gambling and crime were unrelated. Only 14.4 % of the entire samples reported that gambling led directly to their criminal behavior. Another 16.3 % reported that crime had led to gambling which includes 4 offenders who reported starting to gamble in prison or mainly gambling in prison (2 severe problem gamblers, 1 moderate problem gambler, and 1 non-problem gambler). Amongst the 25 severe problem gamblers interviewed, 44.0 % reported that gambling had led to criminal activity. Only 8.0 % of moderate problem gamblers reported that gambling had led to criminal activity. More than a quarter (28.0 %) of the moderate problem gamblers and 37.5 % of the non-randomly selected non-problem gamblers reported that gambling was part of their criminal lifestyle. Most (94.7 %) of the randomly selected non-problem offenders reported that there was no relationship between their crimes and gambling. Using logit modelling it was determined that the number of people reporting that gambling lead to crime versus all other relationships was significantly more common for severe problem gamblers compared to the rest of the sample (Log Likelihood: -47.8 , Adjusted Wald Test $F(1,9) = 19.8$, $p < .01$).

Discussion

Consistent with previous research (Abbott and McKenna 2005; Abbott et al. 2005; Abbott and Volberg 1996; Anderson 1999; Bellringer 1986; Blaszczynski and Silove 1996; Lahn and Grabosky 2003; Nixon et al. 2006; Rosenthal and Lorenz 1992; Templer et al. 1993; Turner et al. 2009; Williams et al. 2005) we found a much higher rate of moderate and severe problem gambling among the offenders sampled compared to the general population, confirming hypothesis 1. As shown in Table 2, the prevalence estimate depends on the measure used, with estimates ranging from 7.8 % according to the DSM-IV to 13.6 % according to the SOGS. These numbers are very similar to the results found by Turner et al. (2009). In addition, the prevalence of severe problem gambling during incarceration was estimated to be 4.7 % according to the DSM-IV, 4.4 % according to the CPGI/PGSI, and 5.3 % according to the SOGS. According to general population studies, 1.14 % of the population will report a severe gambling problem during the past year (Shaffer et al. 1999). Depending on the measure used the results of this study suggest that the prevalence of

previous-year severe problem gambling among offenders prior to incarceration was 7–12 times higher than that found in the general population. Even during incarceration, the rate was 4–5 times higher than the general population.

Consistent with hypothesis 2, a substantial percentage (34.0 %) of offenders reported gambling during their current incarceration. This figure is similar to that reported in previous studies (Williams et al. 2005). The majority of the offender sample (66 %) reported not gambling while inside.

Consistent with hypothesis 3 there were significant correlations between gambling problems prior to incarceration and during incarceration. Only 2.2 % of the sample developed an entirely new gambling problem during their incarceration. In contrast 10.1 % of the sample declined from either moderate or severe problem gambling down to a low or non-problem status during incarceration. The overall drop in prevalence from pre-incarceration to incarceration suggests then that only some problem gamblers continue to gamble problematically in prison. It is unknown if the reduction in gambling problems will be sustained after release. A correlation analysis found that people who suffered from problems with slot machines prior to incarceration showed a substantial decrease in their CPGI/PGSI scores after incarceration. This finding is most likely due to the simple fact that slot machines were not available to the offenders, whereas most other games (e.g., dice, cards, sports bets, even private bets on lottery numbers) could still be played during incarceration. This finding suggests that availability of a game type is an important issue in for problem gamblers. It also suggests that offenders with problems related to slot machine in general did not switch to other types of games in order to continue gambling during incarceration.

The fourth hypothesis was not confirmed. It was expected that problem gamblers would have committed crimes out of financial desperation (Abbott and Volberg 1996; Turner et al. 2009), and therefore their crimes would be income related rather than violent in nature. Although the difference between the federal and provincial prevalence rates suggest that problem gambling may be associated with less serious crimes, we found no overall correlation between severity of problem gambling and the number of income producing crimes. Some of the most common convictions were for income producing crimes such as theft; however, this was true for both problem and non-problem gamblers. These finding contradict the results reported by Turner et al. (2009). However, CPGI/PGSI scores during incarceration were significantly associated with more violent crimes contradicting our hypothesis. It is clear from these results that offenders with severe gambling problems can also be violent criminals.

The difference between these studies in terms of income producing crimes may be related to the setting. Turner et al. (2009) was conducted with a cross section of newly convicted federal offenders. The current study sampled offenders during their sentence. The sampling method in the current study may have oversampled violent offenders with longer sentences simply because those offenders with longer sentences remain in prison longer. As evidence, in Turner's sample, the median length of the sentence was 147 weeks for the federal offenders, but in the current study the median length of sentence was 290 weeks for the federal offenders. The method used in Turner et al. (2009) may have been better for examining the relationship between gambling and criminal behavior prior to conviction. However, the method used in the current study was more appropriate for examining gambling within the correctional institutions. Income producing crimes may be associated with problem gambling amongst newly convicted offenders. However, once in the correctional facility, gamblers with a history of violence appear to be more likely to continue gambling than those without of history of violence.

Hypothesis 5 was verified in that 44 % of the severe problem gamblers interviewed reported that their gambling lead to their involvement in crime whereas only 8 % of moderate problem gamblers reported that their gambling lead to their involvement in crime. This figure is lower than the 65 % reported in Turner et al. (2009), but nonetheless the results are consistent with the earlier study. In addition we also replicated the findings from Turner et al. (2009) regarding gambling and the criminal lifestyle for offenders who scored in the moderate problem gambling range. Based on these findings, it would seem that amongst the most severe problem gamblers some of their crime may be a result of a pre-existing gambling problem, but this is typically not the case amongst moderate problem gamblers. The interview results suggest that moderate and severe problem gamblers maybe quite different populations in terms of the relationship between gambling and criminal conduct. In both studies, it was mostly severe problem gamblers who reported that gambling lead to their criminal behavior. The lower rate of offenders who reported that their gambling lead to their crime compared to Turner et al. (2009) as noted above may be related to the fact that violent offenders who have gambling problems remain in prison longer than the less violent offenders, in part because they tend to commit more offences during their sentence.

Hypothesis 6 was partially confirmed. We did find a higher prevalence rate of gambling problems in provincial compared to federal facilities. However, when we looked into the Federal system, problem gamblers were more likely to be housed in maximum security than in minimum security. It would appear that problem gamblers make up a particularly large percentage of provincial offenders. However, problem gamblers who become career criminals and end up in the federal system are most often found in maximum security settings. A possible implication is if problem gambling is dealt with at the provincial level, it might reduce the number of problem gamblers who go on to commit more serious federal offences and end up in maximum security.

Another interesting aspect of these findings is that even though minimum security offenders have more recreational time and less supervision than those in maximum security, fewer minimum security offenders reported engaging in gambling while incarcerated compared to those in maximum security. Some problem gamblers in minimum security were able to achieve abstinence. Perhaps for the offenders in minimum security, the availability of more positive recreational activities may have provided them with alternatives to gambling (Williams 2009). In addition, during the interviews some offenders told us that they did not gamble because they did not wish to jeopardize their relatively comfortable status by being involved in gambling activities. Conversely, the results of the current study suggest tighter controls of maximum security do not seem to discourage gambling in prison.

An examination of institutional charges indicates that offenders who scored higher on the CPGI/PGSI during incarceration were much more likely to have institutional charges including possession of contraband, disrespecting an officer, fights, and possession of a weapon. None of the offenders were found to have been charged with gambling per se, but it is likely that some of the charges for fights or contraband may have been the result of gambling. Similarly, possession of a weapon may be related to the potential violence associated with debt collection. The association of institutional charges and problem gambling while incarcerated may in part explain the larger number of problem gamblers in maximum security institutions. In summary, those gamblers who continue to gamble during incarceration tend to be more violent in terms of their criminal history, and engage in more chargeable offenses during incarceration. Taken together, these results indicate that the relationship between gambling and seriousness of criminal offences is a complex

one. It is therefore important that professionals working within the correctional system become more aware of the potential for gambling problems at all stages of the correctional process (Williams 2009).

As with all research there are limits to the validity of the findings. The results of this study mainly involved self report. To minimize this weakness, the self reports were backed up with in depth clinical interviews for a subsample of the participants, and a file review where possible. Nonetheless, we did not have sufficient time or resources to interview in depth all of the participants. In this study we asked the offenders about gambling problems prior to entering the correctional system; however, the offenders have been in prison for a varied amount of time. Offenders in provincial system for example are reporting on gambling that occurred within the past 2 years, whereas those in maximum security may be reporting on events that occurred more than 5 years ago.

In summary, according to our findings, a substantial number of offenders in the correctional system in Ontario had a severe gambling problem prior to being incarcerated. Roughly half of the problem gamblers continued to have gambling problems during incarceration. Female offenders and offenders who had a problem related to slot machines were less likely to report gambling problems inside the institution. We replicated the findings of Turner et al. (2009) that many severe problem gamblers report that their criminal behavior was directly related to their gambling problem; however, we found no relationship between the number of income crimes and problem gambling measures. In addition, gambling inside was associated with more violent crimes prior to incarceration and more institutional charges during incarceration. Severe problem gamblers are most often found at the two opposite ends of the prison system with the largest number being found in provincial prisons serving short sentences, and a second group found in maximum security federal prisons. The large numbers of problem gamblers in the correctional population means that affordable and accessible treatment options are needed within the correctional system for those who struggle with gambling problems (Williams 2009).

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Conflict of interest None.

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