

Concerted actions program

Appendix to full research report

Jeffrey Derevensky, Rina Gupta

Institution managing award: McGill University

Gambling and video game playing among adolescents
(French title: *Participation des adolescents aux jeux vidéo et aux jeux d'argent*)
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Impacts socioéconomique des jeux de hasard et d'argent 2009-2010

Appendix 1: Instruments

Instruments developed by The International Centre for Youth Gambling Problems and High-Risk Behaviors

- Internet Gambling Questionnaire
- Video Game Activities Questionnaire
- Gambling Expectancy Questionnaire (Gillespie, Derevensky & Gupta, 2007)

Standardized instruments

- DSM-IV-MR-J (Fisher, 1993)
- Game Addiction Scale (Lemmens, Valkenburg, & Peter, 2009)
- Eysenck Personality Questionnaire – Revised (Short-form) (EPQ-R Short; Eysenck, Eysenck, & Barrett, 1985)
- I₇ Impulsiveness Questionnaire (Eysenck, Pearson, Easting, & Allsopp, 1985)

Appendix 2: Detailed Results

Participant information

Overall, 1,276 CEGEP (college) students participated and completed all the instruments. Fourteen were unusable due to inconsistent responding or missing information. One questionnaire was excluded as no gender was specified. A further 32 questionnaires were not included because the respondents were older than 24. The final sample included 1,229 individuals (534 males, 695 females) aged 16-24 years ($M = 18.69$, $SD = 1.41$) (see Table 1 for the distribution).

Table 1. *Sample Distribution by Gender and Age Group*

	Sample Distribution	
	<i>N</i>	%
Gender		
Male	534	43.4
Female	695	56.6
Age Group		
Under 18	150	12.2
18-20	944	76.8
21-24	131	10.7
Age not specified	4	0.3
Total	1229	100

Key Results

Section 1 - Gambling

Overall, 51.8% ($N = 637$) of participants (68.2% of males, 39.3% of females) reported gambling in the past year. Over one-quarter (32.2%) reported having first gambled at age 18, with 61.4% beginning gambling for money before age 18. The mean age respondents gambled for initial gambling was 15.89 ($SD = 2.57$). A total of 51.8% of students reported land-based gambling during the past 12 months, 40.6% reported playing gambling-type games on the Internet (without money on play-for-fun gambling sites), and 4.8% reported gambling on the Internet (with money) in the past year (see Table 2).

Significantly more males than females reported land-based gambling behaviour

$[\chi^2(1, N = 1229) = 100.91, p < .001]$, playing Internet gambling-type games (without money) $[\chi^2(1, N = 1229) = 154.82, p < .001]$, and gambling for money on the Internet $[\chi^2(1, N = 1229) = 54.26, p < .001]$ (see Table 2).

Table 2. *Gambling Participation in Past 12 Months by Gender and Gambling Severity*

	Gambling Participation ¹			
	<i>N</i>	Land-based	Internet (without money)	Internet (with money)
Gender***				
Male	534	68.2 (364)	60.5 (323)	9.9 (53)
Female	695	39.3 (273)	25.3 (176)	0.9 (6)
Age group				
Under 18	150	34.0 (51)***	39.3 (59)	2.7 (4)
18-20	944	52.9 (499)***	40.7 (384)	4.7 (44)
21-24	131	64.9 (85)***	42.7 (56)	8.4 (11)
Gambling Severity***				
Non-gamblers ^a	590	-	24.7 (146)	-
Social gamblers ^b	604	99.7 (602)	53.6 (324)	8.3 (50)
Problem gamblers ^c	35	100 (35)	82.9 (29)	25.7 (9)
Total	1229	51.8 (637)	40.6 (499)	4.8 (59)

¹Percentage

^aDSM-IV score = 0, no gambling activity (on or off the Internet) in past 12 months.

^bDSM-IV score (0-2).

^cDSM-IV score (≥ 3).

*** $p \leq .001$

Section 2 - Problem Gambling

Due to the small number of PPGs ($n=6$) in the present sample, for statistical considerations those participants who reported gambling in the past year and who endorsed three or more items on the DSM-IV were categorised as problem gamblers. A total of 48.0% of the sample was classified as non-gamblers, 49.1% as social gamblers, and 2.8% as problem gamblers (see Table 3). Overall, there were significant differences in DSM-IV classification of

gambling severity among males and females [$\chi^2(2, N = 1229) = 115.76, p < .001$] and among age groups [$\chi^2(4, N = 1225) = 29.81, p < .001$] (see Table 3).

Table 3. *Gambling Severity by Gender and Age Group*

	N	Gambling Severity ¹		
		Non ^a	Social ^b	Problem ^c
Gender***				
Male	534	31.5 (168)	62.9 (336)	5.6 (30)
Female	695	60.7 (422)	38.6 (268)	0.7 (5)
Age group***				
Under 18	150	66.0 (99)	32.7 (49)	1.3 (2)
18-20	944	46.9 (443)	49.9 (471)	3.2 (30)
21-24	131	35.1 (46)	62.6 (82)	2.3 (3)
Unknown	4	-	-	-
Total	1229	48.0 (590)	49.1 (604)	2.8 (35)

¹Percentage (number of participants in parentheses)

^aDSM-IV score = 0, no gambling activity (on or off the Internet) in past 12 months.

^bDSM-IV score (0-2).

^cDSM-IV score (≥ 3).

*** $p < .001$

Of problem gamblers, 45.7% reported playing MMORPGs, versus 34.7% of social gamblers, and 22.2% of non-gamblers [$\chi^2(2, N = 1227) = 27.54, p < .001$] (see Table 4). With respect to video games, 91.4% of problem gamblers, 94.7% of social gamblers, and 85.6% of non-gamblers reported playing video games [$\chi^2(2, N = 1227) = 26.14, p < .001$] (see Table 4)

Table 4. *Relationship between gambling and gaming*

	N	Past-year MMORPG playing ¹	Past-year video game playing ¹
Gambling Severity***			
Non-gamblers	590	22.2 (131)	85.6 (505)
Social gamblers	602	34.7 (209)	94.7 (570)
Problem gamblers	35	45.7(16)	91.4 (32)
Total	1227	29.0 (356)	90.2 (1107)

¹Percentage (number of participants in parentheses)

*** $p < .001$

Section 3 – Video Game Playing

A total of 90.2% of students reported playing video games during the past 12 months. Significantly more males than females reported playing videogames [$\chi^2(1, N = 1227) = 69.92, p < .001$] (see Table 5). A third (33.8%) of participants reported playing video games for the first time at age 10, with the mean age of initially playing video games being 9.30 ($SD = 2.87$).

Section 4 - Massively Multiplayer Online Role-Playing Games

Overall, 29.0% ($N = 356$) respondents reported playing MMORPGs in the past year. Significantly more males than females reported playing MMORPGs [$\chi^2(1, N = 1225) = 194.74, p < .001$] (see Table 5). The mean age of first playing MMORPGs was 13.39 ($SD = 2.71$).

Table 5. *Gaming Participation in Past 12 Months by Gender and Gaming Severity*

	Gaming Participation ¹		
	N	Videogames	MMORPGs
Gender***			
Male	533	98.3 (524)	49.6 (264)
Female	694	84.0 (583)	13.1 (91)
Gaming Severity***			
Non-gamer ^a	115	-	-
Social gamer ^b	1077	99.5 (1072)	30.2 (325)
Addicted gamer ^c	35	100 (35)	88.6 (31)
Total	1227	90.2 (1107)	28.9 (355)

¹Percentage (number of participants in parentheses)

^aGame Addiction Scale score = 0, no gaming activity (including MMORPGs) in past 12 months.

^bGAS score (0-3).

^cGAS score (≥ 4).

*** $p \leq .001$

Section 5 - Problematic Video Game Playing

For the purposes of this study, an item was considered met when a person answered 4 (*often*) or 5 (*very often*) on a 5-point continuum scale, ranging from 1 (*never*) to 5 (*very often*), over the last six months. Using this cut-off point, 2.8% ($N = 35$) of the gamers met at least four of the seven items. There were significant differences in classification of gaming severity among males and

females [$\chi^2(2, N = 1229) = 87.45, p < .001$], with more males than females identified as addicted (see Table 6). There were no significant differences in classification of gaming severity among age groups (see Table 6). There were significant differences in classification of gaming severity among gambling groups [$\chi^2(4, N = 1229) = 35.87, p < .001$], with more problem gamblers than social or non-gamblers identified as addicted gamers (see Table 6).

Table 6. *Gaming Addiction by Gender and Age*

	N	Gaming Severity ¹		
		Non-gamer ^a	Social gamer ^b	Addicted gamer ^c
Gender***				
Male	534	1.5 (8)	93.1 (497)	5.4 (29)
Female	695	15.4 (107)	83.7 (582)	0.9 (6)
Age				
Under 18	150	11.3 (17)	86.7 (130)	2.0 (3)
18-20	944	9.0 (85)	87.9 (830)	3.1 (29)
21-24	131	9.2 (12)	88.5 (116)	2.3 (3)
Gambling Severity***				
Non-gambler	590	13.7 (81)	84.1 (496)	2.2 (13)
Social gambler	604	5.1 (31)	91.9 (555)	3.0 (18)
Problem gambler	35	8.6 (3)	80.0 (28)	11.4 (4)
Total	1229	9.4 (115)	87.8 (1079)	2.8 (35)

¹Percentage (number of participants in parentheses)

^aGame Addiction Scale score = 0, no gaming activity (including MMORPGs) in past 12 months.

^bGAS score (0-3).

^cGAS score (≥ 4).

*** $p < .001$

Four problem gamblers were also identified as addicted gamers [$\chi^2(4, 1229) = 35.87, p < .001$] (see Table 7).

Table 7. *Relationship between Problem Gambling and Gaming Addiction*

	N	Gambling Severity ¹		
		Non-gambler ^a	Social gambler ^b	Problem gambler ^c
Game Addiction Scale***				
Non-gamer ^d	115	70.4 (81)	27.0 (31)	2.6 (3)
Social gamer ^e	1079	46.0 (496)	51.4 (555)	2.6 (28)
Addicted gamer ^f	35	37.1 (13)	51.4 (18)	11.4 (4)
Total	1229	48.0 (590)	49.1 (604)	2.8 (35)

¹Percentage (number of participants in parentheses)

^aDSM-IV score = 0, no gambling activity (on or off the Internet) in past 12 months.

^bDSM-IV score (0-2).

^cDSM-IV score (≥ 3).

^dGame Addiction Scale score = 0, no gaming activity (including MMORPGs) in past 12 months.

^eGAS score (0-3).

^fGAS score (≥ 4).

*** $p < .001$

Overall, significantly more MMORPG players (7.6%) than non-players (3.7%) reported online gambling [$\chi^2(1, N=1227) = 8.44, p = .004$] (Table 8). As well, significantly more video game players (54.2%) than non-players (30.0%) reported past-year offline gambling [$\chi^2(1,1227) = 25.40, p < .001$] (Table 9). There was no significant difference among video game players for Internet gambling.

Table 8. *Relationship between Internet gambling and MMORPG playing*

	N	Past-year Internet gambling ¹	
		Yes	No
Past-year MMORPG playing**			
Yes	356	7.6 (27)	92.4 (329)
No	871	3.7 (32)	96.3 (839)
Total	1227	59	1168

¹Percentage (number of participants in parentheses)

** $p < .01$

Table 9. *Relationship between gambling and videogame playing*

	N	Past-year offline gambling ¹	
		Yes	No
Past-year videogame playing**			
Yes	1107	54.2 (600)	45.8 (507)
No	120	30.0 (36)	70.0 (84)
Total	1227	59	1168

¹Percentage (number of participants in parentheses)

** $p < .01$

Regression analyses

A sequential logistic regression analysis was performed to assess prediction of past year gambling, first on the basis of two demographic predictors and then addition of past-year videogame playing as a predictor. Demographic predictors were gender and age. A test of the full model with all three predictors against a constant-only model was statistically significant

$[\chi^2(3,1229) = 141.43, p < .001]$, indicating that the predictors, as a set, reliably distinguished between having gambled in the past year or not. Classification was not noteworthy, with 67.6% of the non-gamblers and 62.9% of the gamblers correctly predicted, for an overall success rate of 65.2%

Regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for each of the three predictors are presented in Table 10. Gender was the strongest predictor, with males being three times more likely to have gambled in the past year. As respondents get older the likelihood of gambling increases; each increase in age by one year increases the odds of having gambled by 72%. Those who have played videogames are nearly twice as likely to have gambled in the past year.

Table 10. *Binary Logistic Regression Predicting Gambling*

	β	Wald	Exp(β)	95% C.I.	p
Male gender	1.12	78.93	3.06	2.39-3.92	< .001
Age	.249	25.59	1.28	1.17-1.40	< .001
Videogame playing	.569	6.75	1.76	1.15-2.72	< .01

A sequential logistic regression analysis was performed to assess prediction of past year Internet gambling, first on the basis of gender as a demographic predictor, followed by the addition of past-year MMORPG playing as a predictor. A test of the full model with both predictors against a constant-only model was statistically significant $[\chi^2(2,1229) = 59.05, p < .001]$, indicating that the predictors, together, reliably distinguished between having gambled online in the past year or not. However, MMORPG playing did not significantly predict online gambling, though gender was strongly predictive. Classification was interesting, with 100% of the non-gamblers and none of the gamblers correctly predicted, for an overall success rate of 95.2%

Table 11 presents regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for each predictor. Being male makes it 12 times more

likely a respondent will have gambled online (past year) and playing on practice sites makes increases the likelihood of Internet gambling for money by 6 times.

Table 11. *Binary Logistic Regression Predicting Internet Gambling*

	β	Wald	Exp(β)	95% C.I.	p
Male gender	2.54	32.38	12.71	5.30-30.52	< .001
MMORPG playing	-.011	.002	.989	.570-1.72	NS
Playing on practice sites	1.82	20.85	6.17	2.83-13.47	<.001

Section 6 - Main hypotheses

1. Online gamblers and MMORPG players will have similar personality traits, in particular on measures of Impulsivity and Extraversion.

This turned out to be the case for online gamblers in general. There was no significant difference between online gamblers ($M = 8.43, SD = 4.46$) and MMORPG players ($M = 8.25, SD = 4.35$) on the Impulsivity measure. As well, there was no significant difference between online gamblers ($M = 9.41, SD = 3.10$) and MMORPG players ($M = 8.48, SD = 3.24$) for Extraversion scores. There was no significant difference between online gamblers ($M = 3.17, SD = 2.03$) and MMORPG players ($M = 2.87, SD = 1.98$) for Psychoticism scores and no significant difference between online gamblers ($M = 4.04, SD = 3.30$) and MMORPG players ($M = 4.84, SD = 3.25$) on a Neuroticism measure was found. Internet gamblers had significantly higher ($M = 11.34, SD = 2.69$) Venturesomeness scores than MMORPG players ($M = 10.28, SD = 3.32$) [$t(386) = 2.15, p < .05$].

2. MMORPG players, relative to non-players, will be more likely to participate in online gambling activities.

Significantly more MMORPG players (7.6%) than non-players (3.7%) reported online gambling [$\chi^2(1, N = 1227) = 8.44, p < .01$].

3. Among problem gamblers, relative to non-problem gamblers, there will be higher rates of MMORPG playing.

This hypothesis was supported. Of problem gamblers, 45.7% reported playing MMORPGs, versus 34.7% of social gamblers, and 22.2% of non-gamblers [$\chi^2(2, N = 1227) = 27.54, p < .001$].

4. Problem gamblers will have higher rates of depression relative to non-problem gamblers. MMORPG players will also have higher rates of depression.

While there was a trend toward significance for rates of depression among problem gamblers ($M = 62.59, SD = 14.26$) [social gamblers ($M = 58.82, SD = 12.41$) and non-gamblers ($M = 60.40, SD = 13.05$)], the results were not statistically significant ($F(2, 1198) = 2.91, p = .055$). Post-hoc Dunnett T3 tests revealed no significant differences among groups. There were also no significant differences in overall depression score for MMORPG players ($M = 60.02, SD = .72$) versus non-players ($M = 59.57, SD = .46$).