

Predictors of problem gambling among seniors in Ontario

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Abstract

Seniors are at particular risk for problem gambling due to lifecycle events such as retirement, loss of a partner, limited income, and normative age-related cognitive decline. In addition to these person-level factors, the environmental context may also influence seniors' gambling. We analyzed the Ontario Seniors Gambling data ($N = 2,103$) to explore the effects of person-level, environmental, and person-level by environmental effects of gambling outcomes. Person-level predictors included attitudes towards the benefits and harms of gambling, whether gambling should be legalized, and a set of gambling approach and avoidance motives. Environmental predictors included proximity to the nearest casino, being part of an organized group visiting the casino, and coming alone to the casino. Three outcomes were modeled: frequently gambling at slot and electronic gaming machines (EGMs) which are increasingly favoured by problem gamblers, gambling expenditure, and problem gambling. Older age, male sex, avoidance motives for gambling, and geographic proximity were positively associated with frequent gambling at slot machines and EGMs. Female sex, negative views about the legalization of certain types of gambling, approach and avoidance motives, visiting the casino without an organized group or coming alone, and frequently playing slot machines and EGMs predicted higher gambling expenditure. Problem gambling was more likely in younger unmarried and employed seniors who were born out of Canada. Additionally, problem gambling was also more likely in seniors who considered gambling more beneficial than harmful, endorsed avoidance motives, frequently played slots and EGMs, and had relatively high gambling expenditures. Taken together, these findings clarify linkages between sociodemographic, motivational, attitudinal factors, and environmental factors, on the one hand, and economic and psychosocial gambling outcomes, on the other hand. Finally, the findings converge with extant literature in identifying an association between playing slots and EGMs and problem gambling. These results have implications for policymakers and researchers, and highlight points of intervention to reduce the incidence of problem gambling among seniors in Ontario and beyond.

Section 1: Review of the Literature

This report describes a secondary analysis of the Ontario Seniors Gambling dataset, conducted in response to a 2015 Request for Applications by the Gambling Research Exchange Ontario. The Ontario Seniors Gambling dataset includes data from a survey with 2,103 Ontario seniors (aged 55 and older) who were randomly selected to participate in a 15-20 minute exit survey at 7 gambling locations in Ontario in 2013. Participants provided information about their gambling attitudes, gambling behaviour, motives for gambling, gambling-related problems, and gambling expenditures. Participants were also asked how an increase in casinos might impact their behaviour and attitudes. The current secondary analyses extend prior work with the same Ontario Seniors Gambling dataset (McCready, Mann, Turner, Hamilton, Schrans, & Ialomiteanu, 2014). The secondary analyses were guided by the assumption that recreational choices such as gambling may reflect factors within the individual, factors related to the environment, as well as interactions of individual-by-environment factors. We thus fit a series of statistical models linking gambling-related outcomes (including problem gambling) to a set of predictor variables reflecting person-level characteristics, environmental factors, and person-environment interactions to the data. We also included demographic covariates such as sex, age, marital status, education, employment status, income, and ethnicity to probe their influence on gambling. The results of these analyses shed new light on factors which may contribute to seniors' gambling-related outcomes and problem gambling in the Ontario context. Understanding these factors is an important step toward identifying at-risk seniors, and is critical for developing effective policies aimed at preventing a potential rise in problem gambling within Ontario.

Seniors and gambling. In Canada, seniors aged 65 and older constitute the fastest-growing segment of society (Statistics Canada, 2012). The majority of seniors within the province of Ontario gamble (Wiebe, Single, Falkowski-Ham, & Mun, 2004). Problem gambling refers to gambling-related behaviours which create negative fallout for gamblers, their social environments, or their communities (Ferris & Wynne, 2001). Although most seniors who gamble do not experience gambling-related problems, a significant proportion does (Petry, 2002). Research has shown that those who gamble in casinos are at a higher risk of problem gambling compared to those who do not (McCready et al., 2005). The Ontario government is planning to increase the number of casinos, providing easier access to those who gamble, thereby increasing revenue for the province (Ontario Lottery and Gaming Commission, 2012) raising questions about their impact on seniors. Currently, research examining the factors which predict gambling and problem gambling among seniors is limited, and the literature on risk factors of problem gambling in younger adults may not generalize to older cohorts because both person- and environment-level factors differ between age groups. For example, lifecycle events such as retirement or loss of a partner leave many older adults with more disposable time available for gambling (Munro, Cox-Bishop, McVey, & Munro, 2003). As such, seniors may use gambling as a recreational activity to fill time, socialize, or seek distraction – particularly when the physical and social environments are conducive to gambling (e.g., proximity to casinos, access to EGMs). Furthermore, normal aging is associated with decline in executive cognitive functions such as attention and working memory (Braver & West, 2008) which in turn affect decision-making competence (Strough, Parker, & Bruine de Bruin, 2015). In the context of gambling, these cognitive impairments may render older adults especially vulnerable to poor choices and problem gambling (Munro et al., 2003). And finally, it has been observed that Canadian seniors living on limited retirement income are at heightened risk for negative economic impacts of problem gambling (McCready et al., 2010).

Previous findings from the Ontario Seniors Gambling dataset. The original analysis of these data (McCready et al., 2014) focused on providing descriptive statistics for various demographic and gambling-related variables and on exploring predictors of problem gambling. McCready et al. found that senior gamblers included roughly equal proportions of males and females with a broad age distribution. Most respondents came alone or in small groups, rather than in larger organized groups. The majority of seniors surveyed held positive attitudes towards gambling, although a significant minority felt that the harms of gambling outweighed its benefits. Attitudes towards legalization of online gambling were mostly negative, perhaps reflecting a general mistrust in digital media among older casino gamblers. The proportion of problem gamblers among seniors who frequent casinos, as defined by scores of 9 or higher on the Problem Gambling Severity Index (PGSI; cf., Ferris & Wynne, 2001; see Maas et al., in review), was relatively high (1 in 15) compared with the general senior population (~1 in 400), suggesting that older casino gamblers may indeed be at elevated risk. McCready and colleagues (2014) also examined the relationship between specific gambling motives and problem gambling and found that a combination of coping motives (e.g., to deal with depressive feelings), financial motives, and reward-seeking motives for gambling was associated with increased problem gambling. Finally, attitudes toward new casinos were mixed. However, a majority of respondents indicated that greater proximity might lead them to switch to a new casino without affecting the amount of time or money spent. To contextualize these findings from the Ontario Seniors Gambling dataset, the next section provides a review of other relevant literature. The literature review is organized along the theme of person- vs. environment-level predictors of gambling outcomes.

Person-level characteristics. Three types of person-level characteristics were examined: beliefs about the benefits and harms of gambling, opinions about legalized gambling, and motives for gambling.

Table 1.1 : Variables examined in the analysis

<u>Covariates</u>	<u>Person-level variables</u>	<u>Outcomes</u>
Sex	Belief about benefit or ham of gambling	Frequency of different types of gambling
Age	Opinion about legalized gambling	Gambling expenditure
Marital status	Motives for gambling	Absolute debt
Education		Gambling-related debt
Employment status	<u>Environment-level variables</u>	Problem gambling
Household income	Proximity to nearest casino from home	
Ethnicity	Attending casino with an organized group	
	Attending casino alone	

Beliefs about the benefit and harms of gambling. The majority of older adults consider gambling a normative and harmless form of entertainment (Hagen, Nixon, & Solowoniuk, 2005; McNeilly & Burke, 2000). The majority of older adults hold positive attitudes toward participating in gambling activities (Martin, Lichtenberg, & Templin, 2011) and most regard gambling as a social outlet (Hagen et al., 2005; Preston, Shapiro, & Keene, 2007; McNeilly & Burke, 2000). However, the relationship between gambling-related beliefs and gambling behaviour is relatively under-investigated. Psychological research on attitudes and beliefs indicates a pervasive disconnect between attitudes and behaviour (for a review, see Ajzen, 2001) particularly when situational forces such as peer pressure, emotional arousal, stress, or

cognitive load come into play. *Cognitive load* is the amount of mental effort from working memory which is being engaged. Furthermore, stated beliefs and attitudes may also be revised to justify behaviour once it has occurred, thereby reducing *cognitive dissonance* which is the state of having inconsistent thoughts, beliefs, or attitudes relating to behavioural decisions and attitude change (Festinger, 1957). The implication is that stated beliefs about gambling may not map directly onto behavioural measures of gambling. Nevertheless, belief-behaviour associations may exist and may be useful in identifying seniors at risk of gambling problems.

Opinion about legalized gambling. Attitudes towards legal gambling tend to vary for different types of gambling. For example, a New Zealand national survey examined public attitudes on legal gambling, asking participants to identify what types of gambling they considered to be socially undesirable (New Zealand Department of Internal Affairs, 2005). They found that 68% of respondents considered Internet gambling to be socially undesirable, 64% considered non-casino gambling machines as undesirable, and 59% considered casinos as undesirable. Results from this study from New Zealand suggest that online gambling is particularly undesirable, but the extent to which opinions about legalized gambling predict older adults' gambling behaviour in Ontario, Canada is largely unknown.

Motives for gambling. Like younger adults, seniors gamble for a variety of reasons. These include the food served, the opportunity for charitable giving, relatively inexpensive holidays, the need for a safe way to be "bad" (Hagen et al., 2005), finding a quick-fix solution for financial problems (Vander Bilt, Dodge, Panday, Shaffer, & Ganguli, 2004), winning money, passing time, being with others, enjoying freedom, and getting a break from taking care of others (Munro et al., 2003). In addition, some seniors gamble because they are widowed, hope to win money to pay bills, feel isolated from society, are physically disabled, or have health problems which limit older adults from daily activities (Cousins & Witcher, 2007; Stewart, Zack, Collins, & Klein, 2008).

One question yet to be addressed is whether a specific set of gambling motives is particularly predominant among seniors. A study of younger and older female gamblers in New Zealand (Clarke, 2008) found that, across age groups, the motive of seeking release from tension and guilt was predictive of problem gambling, whereas reward-seeking motives were less predictive. In a study of older gamblers in the Detroit, Michigan area (Martin et al., 2011), intrinsic motives (e.g., fun, enjoyment) were self-reported more often than extrinsic motives (e.g., monetary gain).

In addition to the intrinsic/extrinsic dimension, the distinction between approach and avoidance motives has a long history in psychological research (e.g., Elliot, 2006). Approach motivation energizes actions which maximize opportunities for reward, whereas avoidance motivation drives behaviours which lessen negative experiences such as pain, loss, or threat. The lifespan development literature suggests that the relative primacy of approach and avoidance motivation may change with age. In particular, avoidance motivation may gain importance in the context of age-related losses in physical, cognitive, and social domains (Ebner et al., 2006). In other words, older adults may be more motivated to maintain the status quo by avoiding additional losses than to seek out new opportunities for reward. Applied to gambling, older adults could be particularly prone to using gambling as strategy to escape from their everyday reality (e.g., Clarke, 2008; Martin et al., 2011; see also Balodis, Thomas, & Moore, 2014). On the other hand, there is also a sizable body of evidence suggesting that sensitivity to rewards, including financial wins, shows little or no age-related decline (e.g., Samanez-Larkin et al., 2007). Indeed, according to one influential framework of aging and motivation (Carstensen et al., 1999; Mather &

Knight, 2005) aging is associated with an increased orientation towards positive, rewarding signals. This suggests that reward-seeking or approach motivation may also drive older adults' gambling activities. In summary, the psychological literature suggests that motivations to seek out or avoid gains and losses may change with age, yet little is known about how motivational priorities may affect participation in gambling in general or problem gambling in particular.

Environment-level characteristics. The following environmental characteristics were examined: proximity of nearest casino to home, and attending the casino with an organized group or coming alone.

Proximity of nearest casino to home. Not surprisingly, past research shows a positive association between casino proximity and prevalence of problem gambling (Gerstein et al., 1999). Avoiding casino venues is particularly difficult for problem gamblers, with increased proximity to casinos leading to more impulsive gambling (Thomas, Bates, Moore, Kyrios, Meredyth, & Jessop, 2011). However, it is unclear whether geographical proximity interacts with person-level factors (e.g., socioeconomic characteristics or motives for gambling) in affecting gambling-related outcomes.

Attending the casino with an organized group or coming alone. Organized senior groups which tour casinos are common (Wiebe et al., 2004), and there could be important differences between seniors who choose to attend casinos with a group relative to seniors who attend casinos alone or with family or friends. However, outside of the current dataset, we are not aware of studies which have systematically looked at this issue.

Current rationale. The findings reported in the literature and in McCready et al.'s (2014) analysis of the Ontario Seniors Gambling dataset show that both person-level and environment-level factors play a role as predictors of problem gambling among older adults. As noted by McCready et al. (2014, p. 69), the Ontario Seniors Gambling dataset provides rich opportunities for additional exploration of these relationships. In the current secondary analysis, we examined the relative influence of person-level and environmental factors as well as their interactions in predicting gambling-related outcomes. To do so, we employed a two-step approach involving preliminary and primary analyses. At the preliminary analysis stage, we determined which variables to retain for the primary analyses based on considerations of marginal effects or bivariate relationships between a single predictor and the outcome of interest; potential factor structure of a list of gambling motives (i.e., similarities among multiple items); and missing data (see p. 19 of Section 3 for details on missing data). This reduced the number of variables included in the primary analyses, which is an important goal when analyzing a dataset of this size and complexity. As a result, the primary analyses provided a targeted subset of conceptually meaningful and statistically reliable information about relationships between predictors, demographic covariates, and gambling outcomes. From Table 1.1, recall that person-level characteristics included: belief about the benefits or harms of gambling, opinion about legalized gambling, and the motives for gambling. Environment-level characteristics included: proximity of nearest casino from home, attending casino with an organized group, and attending casino alone. The outcomes of interest were chosen based on the results reported by McCready et al. (2014) as well as past research (Wiebe et al., 2004; Levens et al., 2005). The outcome variables included: participation in gambling (in particular, slots and electronic gambling machines or EGMs), estimated gambling expenditure (spending \$1000 or more per month), debt, and problem gambling behavior (i.e., scoring 9 or above on the PGSI). Finally, studies which did not focus specifically on seniors have suggested that EGMs are increasingly favoured by problem gamblers (e.g., Cantinotti & Ladouceur, 2008; Rockloff & Hing, 2013). We thus sought to examine the relationship between playing slots/EGMs and other gambling outcomes among seniors in the current dataset.

Section 2: Data Analysis Approach

What was the purpose of the secondary data analysis?

Secondary data analysis was conducted to explore potential person-level characteristics, environmental variables, and person-by-environment interactions in the prediction of gambling related behaviors and problem gambling among Ontario seniors.

What data did you analyze?

Seniors Gambling in Ontario

How did you analyze the data?

There were two phases of data analysis: (a) preliminary analysis and (b) primary analysis. Preliminary analysis involved empirically operationalizing certain constructs (i.e., potential clusters of gambling motives), variable screening for inclusion into primary analysis, and missing data analysis. Primary analysis involved more complex conditional statistical models in which multiple variables were used to predict key outcomes.

Preliminary analysis. Descriptive statistics and missing data patterns were examined for the variables identified for analysis (see Table 1.1). The covariates of interest were: sex, age, marital status, education, employment status, income, and ethnicity. The predictors were grouped into two sets: (a) person-level characteristics and (b) environmental variables. As described above, person-level characteristics include belief about benefits or harms which gambling has on society, opinion about legalized gambling, belief about which types of gambling should not be legal, and motives for gambling. Environmental variables include proximity of nearest casino or slot location from where participants live, being part of an organized group, and coming alone or not. Finally, the outcomes of interest were frequency of different types of gambling, estimated gambling expenditure, problem gambling, absolute debt, and gambling related debt.

As a variable selection procedure, marginal relationships between covariates and outcome variables as well as predictors and outcome variables were examined with chi-square tests of independence. Stated differently, bivariate relationships were modeled and tests of significance were adjusted to control the false discovery rate (Benjamini & Hochberg, 1995). Adjustments are required to control the rate of false discovery because multiple tests tend to inflate the number of significant findings which include false discoveries (i.e., concluding statistical significance when the true effect is null). Variables which had significant effects on the outcome were used in the primary analysis.

Operationalizing motives for gambling. A total of 15 different types of motives for gambling were measured (e.g., to win money, to watch others gamble, and to escape or forget your worries). These were included as a checklist and participants indicated that they did (Yes) or did not (No) go to the casino for those reasons. These items were designed to measure five domains of gambling motivations (Lee et al., 2007), site-specific characteristics, and self-reported gambling addiction (see van der Maas et al., in review). We conducted a series of factor analyses to examine possible underlying clusters of these motives. Given that factor analysis identifies a limited number of reliable underlying factors, these factors would be used in predictive analysis in place of the 15 separate motives. It was expected that these 15 different motives would factor into two subsets of items reflecting approach motives and avoidance motives. The factor analyses were thus used to empirically determine which combination of

items map onto the two plausible factors of approach and avoidance motives for the purpose of obtaining composite scores to be included in the primary analyses.

Missing data. Missing data among the variables which were included for the primary analysis were also examined. Missing data can bias estimates and these analyses provide information on the extent to which findings can be generalized across the population of seniors who visit casinos with and without missing data. Responses to variables which were missing, *don't know*, and *prefer not to answer* were treated as missing responses. A binary variable was created such that 0 = *no missing* and 1 = *any missing*. A logistic regression model was then fit to the data examining whether missing data was predicted by the covariates in the primary analysis.

Primary analysis. Based on the results of the preliminary analysis, three key outcomes were identified for primary analysis. The first outcome selected was participation in gambling, which captures the behavioural domain of gambling involvement. For this outcome a binary variable indicating participation in gambling at least once a month within the last year using slots or electronic gambling machines (EGMs; 0 = *less than once a month*, and 1 = *monthly or more*) was modeled for two reasons. First, preliminary analyses suggested a different pattern of responses of playing slots or EGMs relative to other forms of gambling (i.e., instant win/scratch tickets, lottery draw tickets, sports lotteries, bingo, other casino games, internet or online gambling, and horse racing). Second, the strong connection between playing slots or EGMs and problem gambling (Cantinotti & Ladouceur, 2008; Rockloff & Hing, 2013) highlights the need to compare older adults who play slots frequently as a potentially vulnerable group against older adults who do not play slots frequently.

The second key outcome we investigated was estimated gambling expenditure. We reduced the four categories (*less than \$100*, *\$101-\$499*, *\$500 - \$999*, and *\$1000 or more*) to two categories to simplify analysis. These categories are (0 = *less than \$1000*, and 1 = *\$1000 or more*).

The third key outcome was problem gambling as indicated by scores on the Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001). Following van der Maas et al. (in review) problem gamblers were defined as those scoring a 9 or higher on the PGSI total score (0 = *PGSI total scores 8 and below*; 1 = *PGSI total scores 9 and above*).

From the preliminary analyses, all of the identified outcomes were binary in nature: participation in slots or EGMs monthly or more often versus not, spending more than \$1,000 per annum on gambling or not, and problem gambler or not. As such, we specified a series of logistic regression models where we predicted the occurrence of each outcome. The following covariates were included in these three logistic regression models: sex, age, marital status, formal employment, and being born in Canada. The person-level predictors included belief about benefits or harms that gambling has on society, opinions about legalized gambling, a count of approach gambling motives, and three avoidance gambling motives. The environmental predictors were proximity to nearest casino, being part of an organized group, and attending the casino alone. Each outcome had a unique set of predictors based on results from the preliminary analyses. For the problem gambling and gambling expenditure outcomes, participation in slots or EGMs was also included as a predictor. Finally, for the outcomes of problem gambling, gambling expenditure and frequent participation in slots or EGMs were also included as predictors. Additionally, person-level by environment-level interaction effects were explored by crossing person-level variables by environmental predictors as two-way interactions.

Strengths of analysis?

The analyses conducted were exploratory and primarily empirically driven although variable selection was initially guided by the assumption that gambling behaviors may reflect factors within the individual and factors related to the environment. Inclusion of variables into primary analyses were determined by null hypothesis significance tests of marginal effects between the outcomes and independent variables (i.e., covariates and predictors) adjusted by the Benjamini-Hochberg (1995) procedure. This adjustment controls for false discoveries, and tends to be less conservative compared to classical approaches to control for inflation of the familywise Type I error rate (e.g., Bonferroni correction). Additionally, potential person by environment effects as two-way interactions were explored and evaluated by significance testing. Because the analytic process is data driven, with controls for the false discovery rate, the results are expected to be a reasonable reflection of statistically significant relationships which are present in the population of seniors who visit casinos in Ontario. Further, the current findings show good convergence with prior literature, lending confidence in their validity.

Limitations of analysis?

The limitations identified in the original analysis (McCready et al., 2014) also hold for the secondary analysis. They concern the inherent limitations of self-report data, which can be subject to response bias and demand characteristics. Additionally, missing data in the sample limits the generalizability of these findings to seniors who would have provided complete data (i.e., males aged below 75). The exploratory aspects of the analysis also prevent strong interpretations along theoretical lines. These results should also be verified in a separate sample to ensure that the findings were not merely capitalizing on chance. Additionally, complex relationships such as higher order interactions (e.g., three-way interactions where an effect of a key predictor on an outcome is moderated by two other predictors) were not examined. Additional studies are necessary to target specific themes identified in the current research (e.g., impact of socio-demographic, motivational, attitudinal, and environmental factors, as well as the role of age-related cognitive decline in proclivity to play games of chance associated with high expenditures and problem gambling).

Section 3: Importance of Findings

What are the key findings of your analysis?

Preliminary analysis. Recall that preliminary analyses were conducted to determine which variables are to be included in the primary analysis. The first subsection details why participation in slot machine gambling was more closely examined as a behavioral outcome of gambling involvement compared to other types of gambling. The second subsection details why certain outcomes were not forwarded for primary analysis. The third subsection on variable selection outlines how the 15 gambling motives were reduced to discrete sets of variables using factor analysis and reliability analysis; and also presents marginal effects of the covariates and remaining predictors on the outcomes of preference for frequently playing slot machines or EGMs, estimated annual gambling expenditure of \$1,000 or more, and problem gambling using chi-square tests of independence. These set of results provide the rationale behind the subset of variables which were selected into the primary analysis. Finally, the fourth subsection on missing data provides descriptive information on the pattern of missing-ness which should be taken into account when generalizing the results of the primary analysis.

Frequency of types of gambling. Table 3.1 below provides the count and frequencies observed for the $N = 2103$ seniors who were interviewed while exiting a casino in Ontario. From Table 3.1, the majority of seniors never participate in sports lotteries, bingo, other casino games, internet or online gambling, and horse racing. The sample of seniors tended to participate in instant win/scratch tickets, lottery draw tickets and slots or EGMs. However, slots and EGMs seem to be the gambling type of choice among these seniors with 79.8% of the sample playing slots or EGMs monthly or more often. A binary variable indicating seniors' participation in slots and EGMs was created such that 1 = *monthly or more often*, and 0 = *less than once a month*. This binary variable on frequency of playing slots and EGMs was also used in Turner et al. (in review).

Outcome selection. The other potential outcomes of estimated gambling expenditure, problem gambling, absolute debt, and gambling related debt were also examined, especially on missing data. There was no missing data on problem gambling. However, 8.65% of responses were missing on estimated gambling expenditure, and 17.83% were missing on absolute debt. Gambling-related debt information was collected on a subset of the sample that indicated some absolute debt, which was available for 446 of the 2103 responses (21.21% of the sample). Because of large missing data, we decided to only analyze the outcomes of estimated gambling expenditure and problem gambling. The primary analysis thus had three main outcomes: playing slots or EGMs monthly or more often, estimated annual gambling expenditure of more than \$1,000, and problem gambling.

Table 3.1: Counts and frequencies of types of gambling activities frequently engaged by seniors.

	Instant win/scratch tickets		Lottery draw tickets		Sports lotteries		Bingo		Slots or electronic gaming machines		Other casino games		Internet or online		Horse racing	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Never	353	16.79	258	12.27	1595	75.84	1381	65.67	8	0.38	1490	70.85	1957	93.06	1220	58.01
Not in last year	101	4.8	110	5.23	187	8.89	349	16.6	12	0.57	191	9.08	63	3	419	19.92
Less than once a month	500	23.78	473	22.49	110	5.23	159	7.56	378	17.97	159	7.56	31	1.47	266	12.65
Monthly	336	15.98	333	15.83	66	3.14	77	3.66	748	35.57	124	5.9	17	0.81	86	4.09
Weekly	707	33.62	870	41.37	112	5.33	124	5.9	863	41.04	106	5.04	17	0.81	84	3.99
Daily	89	4.23	38	1.81	11	0.52	4	0.19	67	3.19	11	0.52	9	0.43	15	0.71
Prefer not to answer	8	0.38	6	0.29	7	0.33	5	0.24	14	0.67	4	0.19	2	0.1	4	0.19
Don't Know	9	0.43	15	0.71	15	0.71	4	0.19	13	0.62	18	0.86	7	0.33	9	0.43

Independent variable selection. Marginal relationships between the independent variables (covariates and predictors) and the potential outcomes are reported below in Tables 3.3 to 3.5. Significance of these relationships was examined using chi-square tests of independence, with control for the false discovery rate at 5% using the Benjamini-Hochberg (1995) procedure. Prior to analyses, responses of *don't know* or *prefer not to answer* were coded as missing. Sex was recoded to female, where 0 = *male* and 1 = *female*. Age was also binned into two categories (young-old versus old-old) as represented by the variable *old-old*, where 0 = *55 to 74 years* and 1 = *75 years and above*. The original variable of marital status was recoded from five levels to two levels of 1 = *married or equivalent* versus 0 = *not married or equivalent*. The original employment item with seven categories was recoded into a binary variable indicating formal employment where 1 = *employed full time, employed part-time, and self-employed* whereas 0 = *retired, homemaker, disabled, and other*.

Ethnicity was multi-faceted with 27 unique combinations of the following categories: White, Black, Arab or Middle Eastern, Asian, Latino, First nation or Aboriginal, East Indian, Other and Canadian. To simplify analyses, we use *born out of Canada* (0 = *no*, 1 = *yes*) in place of ethnicity.

The person-level predictors of belief about gambling had three levels, where gambling had more harms than benefits, benefits are equal to harms, and more benefits than harms. Three levels of opinion on legalized gambling were measured: all types of gambling should be legal, some types of gambling should be legal, and no types of gambling should be legal. The environmental predictor of proximity to nearest casino had five levels, and coming as part of an organized group had two levels (see Tables 3.3 to 3.5). Additionally, responses to the item “Did you come here today alone or with others such as

family members, friends or both” which were *alone, with family, with friends, and with both friends and family* was recoded to (1 = *alone* and 0 = *with others*).

Types of gambling that should be illegal. For the person-level characteristics, we examined the cross-tabs of 10 different types of gambling and whether they should be illegal. There were 102 unique combinations of types of gambling which seniors thought should be illegal; 48.59% of the sample indicated that all types of gambling should be illegal; 18.93% indicated that animal fighting and internet gambling should be illegal, and 12.11% indicated that animal fighting only should be illegal. A small fraction of seniors (0.11%) indicated that all forms of gambling should be made legal. The remaining 98 unique combinations of types of gambling each made up less than 2.35% of the sample, and accounted for 19.93% of the responses. The data suggest that about half of the sample thought that gambling should be illegal, and animal fighting as well as internet gambling emerged as distinct types of gambling that should be made illegal. Instead of examining these 10 types of gambling that should be made illegal, and possibly their 102 unique combinations, we analyzed the proxy item measuring opinions about legalized gambling (see Table 1.1 and 3.3 to 3.5).

Motives for gambling. The motives for gambling checklist included 15 binary items, as described previously (see p. 5 and 6). We conducted a set of exploratory factor analyses, extracting one to three factors to determine if items could be condensed into a composite score which would reduce the number of predictors used in the primary analyses. We used the Mplus software, and specified the following options: delta parameterization, diagonally weighted least squares estimation, and geomin rotation which allowed for factors to be correlated. Further explanation and technical information about these options can be accessed on the support website for the Mplus software (www.statmodel.com). The list of items is presented in Table 3.2 along with response frequencies, factor loadings of the final model, and coefficient α information (i.e., reliability as internal consistency). These 15 items had no missing data, which were presented as a checklist, and seniors tended not to endorse (i.e., check yes, it was a reason they gambled) the following items: “To drink alcohol” (.07% endorsement), “To try to make money to pay off bills or debts” (3.5% endorsement), and “Because I’m addicted to gambling” (2.8% endorsement). Because of low endorsement, these items were expected not to load highly onto extracted factors (see Table 3.2).

The single factor tests the notion that all of the 15 gambling motives measures one underlying factor. This model had mediocre model fit, $\chi^2(df = 90) = 644.63$, RMSEA = .054, CFI = .875, and TLI = .854. The three-factor solution exhibited excellent fit, $\chi^2(df = 63) = 161.69$, RMSEA = .027, CFI = .978, and TLI = .963. However, despite excellent fit, the three-factor model was untenable because of over-factoring, where the third factor did not have items with strong primary loadings (loadings > |.30|) or was dominated by items with cross loadings (i.e., an item loads onto more than one factor). The items with cross loadings (> |.30|) are: “To escape or forget your worries”; “Because it helps when you are feeling anxious, nervous or depressed”; and “To fill time/ boredom”. The two-factor solution was thus considered the best fit to the data, $\chi^2(df = 76) = 286.32$, RMSEA = .036, CFI = .953, and TLI = .935. The two factors were also correlated at $r = .48$, indicating a moderate, positive relationship between the two factors. From Table 3.2, the first cluster of items broadly fall under socially acceptable motives for gambling, and the second cluster of items broadly fall under socially unacceptable motives for gambling. The item “To fill time/boredom” cross-loaded onto the two factors and was not considered to be part of either clusters of items.

Given the two-factor solution, the reliability of these two clusters of items was examined. Coefficient α for the initial first cluster of nine socially acceptable motives was $\alpha = .66$, and coefficient α for the initial five socially unacceptable five motives was $\alpha = .46$. Cluster reliabilities were then examined for delete-one item clusters (see Table 3.2 column α^\dagger). For instance, when the item “For excitement/entertainment/fun/enjoyment” was removed, coefficient alpha for the cluster of the eight remaining socially acceptable motives increased to $\alpha = .68$.

Table 3.2. Item information, factor loadings, and coefficient alpha for gambling motives items.

Item	Yes		No		α^\dagger	Factor Loadings		
	N	%	N	%		$\alpha^1 = .69$	$\alpha^2 = .56$	
M1_1	<i>For Excitement / entertainment / fun / enjoyment</i>	1670	79.4	433	20.6	.68	0.401*	-0.121
M1_3	To socialize with family or friends	817	38.8	1286	61.2	.63	0.755*	-0.226*
M1_4	To watch others gamble	247	11.7	1856	88.3	.62	0.691*	0
M1_5	For musical entertainment and shows	395	18.8	1708	81.2	.63	0.642*	-0.079
M1_6	Because it makes you feel good about yourself	271	12.9	1832	87.1	.60	0.673*	0.304*
M1_7	<i>To drink alcohol</i>	15	0.7	2088	99.3	.67	0.375*	0.178
M1_11	For free / cheap food or drinks	289	13.7	1814	86.3	.65	0.405*	0.161*
M1_12	Because it is a safe location (security)	576	27.4	1527	72.6	.59	0.701*	0.179*
M1_13	To be with other people (loneliness or isolation)	283	13.5	1820	86.5	.63	0.552*	0.245*
M1_2	<i>To win money</i>	806	38.3	1297	61.7	.56	0.076	0.320*
M1_8	To escape or forget your worries	299	14.2	1804	85.8	.34	-0.025	0.819*
M1_9	Because it helps when you are feeling anxious nervous or	135	6.4	1968	93.6	.35	-0.001	0.852*
M1_14	To try to make money to pay off bills or debts	73	3.5	2030	96.5	.38	0.069	0.755*
M1_15	Because I am addicted to gambling	59	2.8	2044	97.2	.43	0.01	0.672*
M1_10	<i>To fill time / boredom</i>	801	38.1	1302	61.9		0.280*	0.271*

Note. * $p < .01$, and α^\dagger Coefficient α when item is removed. ¹Coefficient α for the first cluster of socially acceptable motives, excluding italicized items. ²coefficient alpha for the second cluster of socially unacceptable motives, excluding italicized items.

Based on item reliability information, it was determined that seven socially desirable motives (non-italicized items in Table 3.2) formed a mediocre cluster with $\alpha = .69$. Of interest, is that these seven socially acceptable motives also map onto approach motives for gambling. For the purposes of data reduction, a sum score of these seven approach motives was computed and used in the analyses. The cluster of socially unacceptable motives had low reliability, and removing two items resulted in an improved, but still poor coefficient $\alpha = .56$. The reliability information suggests that the responses to these socially unacceptable motives were not consistent (i.e., unreliable), which suggests these items should be analyzed separately (cf., van der Mass et al., in review). From the reduced cluster of four socially unacceptable motives, two items with extremely low endorsement (“Try to make money to pay off bills or debts” and “Because I’m addicted to gambling”) were not included in the analyses to follow. The remaining two motives (“To escape or forget your worries” and “Because it helps when you are feeling anxious, nervous, or depressed”), were correlated at $r = .42$ and treated as separate. Note that

these two gambling motives map onto avoidance motives. The remaining item of “To fill time/ boredom”, which cross-loaded onto the two factors, was also included in the preliminary analyses.

Marginal effects on playing slots or EGMs. There were significant effects of sex, age, and household income on playing slots or EGMs monthly or more often (see Table 3.3). Males are 1.6 times more likely to play slots and EGMs frequently than females. Additionally, old-old seniors are 1.6 times more likely to play slots or EGMs frequently than young-old seniors. Seniors earning below \$40,000 tended to play slots and EGMs monthly or more often compared to those earning \$40,001 and above.

Table 3.3: Descriptive statistics of independent variables by playing slots and EGMs once a month or more.

Play slots and EGM monthly or more			Yes (N = 1678)		No (N = 398)		$\chi^2(df)$	p-value	adjusted p
	Missing	%	N	%	N	%			
Covariates									
Sex	0	0					17.27 (1)	< .001	< .001*
Male			835	49.76	152	38.19			
Female			843	50.24	246	61.81			
Age	1	0.05					11.78 (1)	< .001	< .001*
Young-old (55 to 74 years)			1142	68.10	306	76.88			
Old-old (above 75 years)			535	31.90	92	23.12			
Marital status	4	0.19					1.29 (1)	.256	.293
Not married or equivalent			569	33.97	123	30.98			
Married or equivalent			1106	66.03	274	69.02			
Education	19	0.90					8.16 (4)	.086	.115
Less than high school			365	21.94	66	16.75			
High school graduate			678	40.75	160	40.61			
Vocational training			100	6.01	21	5.33			
College or university			438	26.32	121	30.71			
Post-graduate Professional			83	4.99	26	6.60			
Employment status	3	0.14					1.78 (1)	.183	.225
Employed (full, part, self)			374	22.32	101	25.44			
Other			1302	77.68	296	74.56			
Household Income	370	17.59					13.87 (5)	.017	.026*
Less than \$20,000			237	17.11	41	12.69			
\$20,000 - \$40,000			457	33.00	100	30.96			
\$40,001 - \$60,000			335	23.19	78	24.15			
\$60,001 - \$80,000			186	13.43	44	13.62			
\$80,000 - \$100,000			98	7.08	41	12.69			
over \$100,000			72	5.20	19	5.88			
Birth place	0	0					1.02 (1)	.312	.332
Born in Canada			1158	69.01	285	71.61			
Born out of Canada			520	30.99	113	28.39			

Note. Missing counts are reported for the independent variable. Adjusted p-values were obtained using the Benjamini-Hochberg (1995) false discovery correction. * $p < .05$, χ^2 = Pearson’s chi-square test statistic and df = degrees of freedom.

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Play slots and EGM monthly or more			Yes (N = 1678)		No (N = 398)		$\chi^2(df)$	p-value	adjusted p
	Missing	%	N	%	N	%			
<u>Person-level predictors</u>									
Belief about gambling	561	26.68					0.52 (2)	.772	.772
More harms than benefits			401	32.00	95	33.93			
Benefits are equal to harms			601	47.97	128	45.71			
More benefits than harms			251	20.03	57	20.36			
Opinion on legalized gambling	288	13.69					6.11 (2)	.047	.069
All types should be legal			669	45.63	126	38.18			
Some types legal			719	49.05	185	56.06			
No types legal			78	5.32	19	5.76			
Motives for gambling	27	1.28							
Approach motives (sum of 7)‡			1.42¹	1.62²	1.21₁	1.48²	2.42 (640.44)³	.022	.026*
Escape to forget worries							9.10 (1)	.003	.006*
Endorsed			259	15.44	38	9.55			
Not endorsed			1419	84.56	360	90.45			
Helps with negative feelings^a							11.32 (1)	< .001	.002*
Endorsed			124	7.39	11	2.76			
Not endorsed			1554	92.61	387	97.24			
To fill time/boredom							46.71 (1)	< .001	< .001*
Endorsed			703	41.90	93	23.37			
Not endorsed			975	58.10	305	76.63			
<u>Environmental predictors</u>									
Proximity to nearest casino	10	0.48					38.35 (4)	< .001	< .001*
0 - 10 km			557	33.29	98	24.87			
11 - 25 km			545	32.58	117	29.70			
26 - 50 km			451	26.96	115	29.19			
51 - 100 km			90	5.38	50	12.69			
Over 100 km			30	1.80	14	3.55			
Part of an organized group	2	0.10					6.46 (1)	.011	.022*
No			1577	94.04	386	97.23			
Yes			100	5.96	11	2.77			
Come alone	3	0.14					17.72 (1)	< .001	< .001*
No			1213	72.42	329	82.66			
Yes			462	27.58	69	17.34			

Note. Missing counts are reported for the independent variable. Adjusted p-values were obtained using the Benjamini-Hochberg (1995) false discovery correction. * $p < .05$, χ^2 = Pearson's chi-square test statistic and df = degrees of freedom. ‡Approach motives are a count where ¹means, ²standard deviations, and ³t-tests with Satterthwaite dfs were reported. ^aNegative feelings include feeling anxious, nervous, or depressed.

For the primary analysis on frequently playing slots and EGMs, the following independent variables were included in the model: sex, age, count of approach motives for gambling, the three separate avoidance motives for gambling, proximity to nearest casino, and coming alone. Household

income was excluded because of the high level of missing data; coming as part of an organized group was excluded because of sparseness.

Marginal effects on spending more than \$1,000 on gambling. There were significant marginal effects of sex, level of education, and household income on annual gambling expenditure (see Table 3.4). Males are 2.4 times more likely to spend \$1,000 or more on gambling relative to females. Seniors with less than a high school or with post-graduate and professional education tend to spend \$1,000 or more on gambling than seniors with high school and vocational training. Seniors with household income of more than \$60,000 also tend to spend more than \$1,000 on gambling per year.

Table 3.4: Descriptive statistics of independent variables by annual gambling expenditure.

Gambling expenditure > \$1000			Yes (N = 743)		No (N = 1178)		$\chi^2(df)$	p-value	adjusted p
	Missing	%	N	%	N	%			
Covariates									
Sex	0	0					13.84 (1)	< .001	< .001*
Male			399	53.70	530	44.99			
Female			344	46.30	648	55.01			
Age	1	0.05					0.36 (1)	.551	.588
Young-old (55 to 74 years)			517	69.58	834	70.86			
Old-old (above 75 years)			226	30.42	343	29.142			
Marital status	4	0.19					2.09 (1)	.149	.183
Not married or equivalent			261	35.22	377	32.03			
Married or equivalent			480	64.78	800	67.97			
Education	19	0.90					12.58 (4)	.014	.022*
Less than high school			174	23.48	216	18.48			
High school graduate			271	36.57	502	42.94			
Vocational training			41	5.53	76	6.50			
College or university			210	28.34	320	27.37			
Post-graduate Professional			45	6.07	55	4.70			
Employment status	3	0.14					3.41 (1)	.065	.086
Employed (full, part, self)			553	74.53	921	78.18			
Other			189	25.47	257	21.82			
Household Income	370	17.59					19.55 (5)	.002	.004*
Less than \$20,000			97	15.13	160	16.15			
\$20,000 - \$40,000			189	29.49	347	35.02			
\$40,001 - \$60,000			150	23.40	247	24.92			
\$60,001 - \$80,000			93	14.51	129	13.02			
\$80,000 - \$100,000			63	9.83	71	7.16			
over \$100,000			49	7.64	37	3.73			
Birth place	0	0					1.89 (1)	.169	.193
Born in Canada			504	67.83	834	70.80			
Born out of Canada			239	32.17	344	29.20			

Note. Missing counts are reported for the independent variable. Adjusted p-values were obtained using the Benjamini-Hochberg (1995) false discovery correction. *p < .05.

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Gambling Expenditure > \$1000			Yes (N = 743)		No (N = 1178)		X ² (df)	p-value	adjusted p
	Missing	%	N	%	N	%			
<u>Person-level predictors</u>									
Belief about gambling	561	26.68					6.77 (2)	.034	.050*
More harms than benefits			214	35.97	249	29.47			
Benefits are equal to harms			267	44.87	419	49.59			
More benefits than harms			114	19.16	177	20.95			
Opinion on legalized gambling	288	13.69					9.30 (2)	.010	.017*
All types should be legal			327	48.37	412	41.00			
Some types legal			318	47.04	533	53.03			
No types legal			31	4.59	60	5.97			
Motives for gambling	27	1.28							
Approach motives (sum of 7)			1.67¹	1.71²	1.25¹	1.52²	5.51 (1439)³	< .001	< .001*
Escape to forget worries							22.57 (1)	< .001	< .001*
Endorsed			141	18.98	132	11.21			
Not endorsed			602	81.02	1046	88.79			
Helps with negative feelings^a							8.96 (1)	.003	.006*
Endorsed			65	8.75	62	5.26			
Not endorsed			678	91.25	1116	4.74			
To fill time/boredom							71.49 (1)	< .001	< .001*
Endorsed			372	50.07	363	30.81			
Not endorsed			371	49.93	815	69.19			
<u>Environmental predictors</u>									
Proximity to nearest casino	10	0.48					2.66 (4)	.617	.617
0 - 10 km			241	32.52	357	30.43			
11 - 25 km			242	32.66	373	31.80			
26 - 50 km			199	26.86	328	27.96			
51 - 100 km			44	5.94	87	7.42			
Over 100 km			15	2.02	28	2.39			
Part of an organized group	2	0.10					7.52 (1)	.006	.012*
No			716	96.37	1100	93.46			
Yes			27	3.63	77	6.54			
Come alone	3	0.14					25.51 (1)	< .001	< .001*
No			509	68.51	928	78.78			
Yes			234	31.49	250	21.22			

Note. Missing counts are reported for the independent variable. Adjusted p-values were obtained using the Benjamini-Hochberg (1995) false discovery correction. *p < .05, X² = Pearson's chi-square test statistic and df = degrees of freedom. †Approach motives are a count where ¹means, ²standard deviations, and ³t-tests with Satterwaite dfs were reported. ^aNegative feelings include feeling anxious, nervous, or depressed.

Among the person-level factors, seniors with more negative views on legalized gambling tended to spend more than \$1,000 on gambling; seniors who indicated that all types of gambling should be legal tended to be those who spend \$1,000 more on gambling. Seniors who selected more types of approach and avoidance gambling motives tended to spend more than \$1,000 on gambling per year. Seniors who were not part of an organized group at the casino were 1.9 times more likely to spend more than \$1,000 on gambling compared to seniors who were part of an organized group. Similarly, seniors who came alone were 1.7 times more likely to spend more than \$1,000 on gambling compared to seniors who came with others.

For the primary analysis on spending more than \$1,000 per year on gambling, the following independent variables were included in the model: sex, opinions about legalized gambling, gambling motives, coming with an organized group, and coming alone. Household income was excluded because it was high on missing data; education was also excluded because of potential sparseness of the data. Additionally, the gambling behaviour of frequenting slots and EGMs was also included as a predictor of gambling expenditure.

Marginal effects on problem gambling. Among the covariates, there were significant marginal effects of age, marital status, employment status, household income, and being born in Canada on problem gambling (see Table 3.5 below).

Table 3.5: Descriptive statistics of independent variables by problem gambling.

Problem Gambling			Yes (N = 78)		No (N = 2016)		$\chi^2(df)$	p-value	adjusted p
	Missing	%	N	%	N	%			
<u>Covariates</u>									
Sex	0	0					0.001 (1)	.975	.975
Male			37	47.44	960	47.62			
Female			41	52.56	1056	52.38			
Age	1	0.05					4.69 (1)	.030	.044*
Young-old (55 to 74 years)			63	80.77	1396	69.28			
Old-old (above 75 years)			15	19.23	619	30.72			
Marital status	4	0.19					9.33 (1)	.002	.005*
Not married or equivalent			38	49.35	657	32.64			
Married or equivalent			39	50.65	1356	67.36			
Education	19	0.90					6.57 (4)	.160	.197
Less than high school			18	23.08	419	20.98			
High school graduate			22	28.21	819	41.01			
Vocational training			4	5.13	122	6.11			
College or university			28	35.90	535	26.79			
Post-graduate Professional			6	7.69	102	5.11			

Missing counts are reported for the independent variable. Adjusted p-values were obtained using the Benjamini-Hochberg (1995) false discovery correction. * $p < .05$, χ^2 = Pearson's chi-square test statistic, and df = degrees of freedom.

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Problem Gambling			Yes (N = 78)		No (N = 2016)		$\chi^2(df)$	p-value	adjusted p
	Missing	%	N	%	N	%			
Employment status	3	0.14					16.06 (1)	< .001	< .001*
Employed (full, part, self)			32	41.56	444	22.05			
Other			45	58.44	1570	77.95			
Household Income	370	17.59					12.85 (5)	.025	.040*
Less than \$20,000			23	31.51	263	15.92			
\$20,000 - \$40,000			19	26.03	547	33.11			
\$40,001 - \$60,000			13	17.81	401	24.27			
\$60,001 - \$80,000			8	10.96	221	13.38			
\$80,000 - \$100,000			6	8.22	132	7.99			
over \$100,000			4	5.48	88	5.33			
Birth place	0	0					7.82 (1)	.005	.010*
Born in Canada			43	55.13	1411	69.99			
Born out of Canada			35	44.87	605	30.01			
<u>Person-level predictors</u>									
Belief about gambling	561	26.68					57.82 (2)	<.001	< .001*
More harms than benefits			50	74.63	449	30.54			
Benefits are equal to harms			15	22.39	715	48.64			
More benefits than harms			2	2.99	306	20.82			
Opinion on legalized gambling	288	13.69					15.88 (2)	< .001	< .001*
All types should be legal			30	42.86	768	44.04			
Some types legal			29	41.43	890	51.03			
No types legal			11	15.71	86	4.93			
Motives for gambling	27	1.28							
Approach motives (sum of 7)‡			1.33¹	1.65²	1.37¹	1.59²	0.21 (82.62)³	.831	.950
Escape to forget worries							42.922 (1)	< .001	< .001*
Endorsed			31	39.74	268	13.29			
Not endorsed			47	60.26	1748	86.71			
Helps with negative feelings^a							43.10 (1)	< .001	< .001*
Endorsed			19	24.36	116	5.75			
Not endorsed			59	75.64	1900	94.25			
To fill time/boredom							7.08 (1)	.008	.014*
Endorsed			41	47.44	1257	62.35			
Not endorsed			37	47.44	127	62.35			

Note. Missing counts are reported for the independent variable. Adjusted p-values were obtained using the Benjamini-Hochberg (1995) false discovery correction. * $p < .05$, χ^2 = Pearson's chi-square test statistic and df = degrees of freedom. ‡Approach motives are a count where ¹means, ²standard deviations, and ³t-tests with Satterwaite dfs were reported. ^aNegative feelings include feeling anxious, nervous, or depressed.

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Problem Gambling	Missing	%	Yes (N = 78)		No (N = 2016)		$\chi^2(df)$	p-value	adjusted p
			N	%	N	%			
<u>Environmental predictors</u>									
Proximity to nearest casino	10	0.48					7.17 (4)	.127	.170
0 - 10 km			19	24.68	640	31.89			
11 - 25 km			32	41.56	636	3.69			
26 - 50 km			23	29.87	550	27.40			
51 - 100 km			1	1.30	138	6.88			
Over 100 km			2	2.60	43	2.14			
Part of an organized group	2	0.10					0.003 (1)	.958	.958 [†]
No			74	94.87	1908	94.74			
Yes			4	5.13	106	5.26			
Come alone	3	0.14					18.46 (1)	<.001	<.001 [*]
No			42	53.85	1519	75.42			
Yes			36	46.15	495	24.58			

Note. Missing counts are reported for the independent variable. Adjusted *p*-values were obtained using the Benjamini-Hochberg (1995) false discovery correction. **p* < .05, χ^2 = Pearson's chi-square test statistic and *df* = degrees of freedom. [†]25% of the cells have sample sizes of less than 5 and *p*-values are likely to be inaccurate.

Old-old seniors were 1.1 times more likely to be problem gamblers compared to young-old seniors. Unmarried seniors were 2.0 times more likely to be problem gamblers compared to married seniors. Seniors who are formally employed are 2.5 times more likely to be problem gamblers compared to those not formally employed. Household income was related to problem gambling in that those with less than \$20,000 household income were more likely to be problem gambling seniors. Additionally, seniors born out of Canada are also 1.9 times more likely to be problem gamblers compared to seniors born in Canada.

For the person-level variables, seniors who consider gambling to have more harms than benefits were more likely to be problem gamblers compared to non-problem gamblers; seniors who more often stated that the benefits and harms of gambling are equal as well as gambling having more benefits than harms were more likely to be non-problem gambling seniors compared to problem gambling seniors. Seniors who indicated that no types of gambling should be legal tend to be problem gamblers more often than non-problem gamblers. Seniors who endorsed the avoidance gambling motives "To escape or forget your worries", "Because it helps when you are feeling anxious, nervous or depressed", and "To fill time/boredom", tended to be problem gamblers. Finally, seniors who came alone to casinos were more likely to be problem gamblers compared to those who came with someone else.

For the primary analysis on problem gambling, the following independent variables were included in the model: age, marital status, formal employment, being born in Canada, beliefs about the benefits and harms of gambling, opinions about legalizing gambling, the three avoidance gambling motives, and coming alone to the casino. Household income was excluded because it was high on

missing data. Additionally, the gambling behaviors of frequenting slots and EGMs as well as spending more than \$1,000 annually on gambling was also included as predictors of problem gambling.

Missing data. Missing data patterns were examined in the final data set which included the following variables: sex, age, marital status, formal employment, being born in Canada, beliefs about the harms and benefits of gambling, opinions about legalizing gambling, the count of seven approach gambling motives, the three avoidance gambling motives, proximity of the closest casino, coming to the casino as part of an organized group, coming alone, playing slots and EGMs monthly or more frequently, annual gambling expenditure of more than \$1,000, and problem gambling. A missing data variable (1 = missing on any variables and 0 = no missing) was created, and predicted by the covariates of sex, age, marital status, formal employment, and being born in Canada.

Among these 13 variables, 62.43% ($n = 1313$) participants had no missing data; 26.15% ($n = 550$) were missing data on a single variable; 8.94% ($n = 188$) were missing data on two variables; 2.14% ($n = 45$) were missing data on three variables; 0.29% ($n = 6$) were missing data on four variables; and 0.05% ($n = 1$) were missing data on 5 variables. Table 3.6 below provides parameter estimates of the logistic regression on missing data, where the probability of missing is modeled.

Table 3.6: Predictors of missing values in the data set for the primary analysis

Parameter	log-odds	S.E.	$\chi^2(df = 1)$	p -value	OR	OR 95% CI
Intercept	-0.95	0.12	63.54	<.001*	0.33	
Female	0.53	0.09	32.54	<.001*	1.70	[1.42, 2.05]
Old-old (above 75 years)	0.28	0.10	7.02	.008*	1.32	[1.08, 1.62]
Married	0.12	0.10	1.52	.218	1.13	[0.93, 1.37]
Formally employed	-0.17	0.12	2.00	.157	0.85	[0.67, 1.07]
Born outside of Canada	0.001	0.10	0.0002	.990	1.00	[0.82, 1.22]

Note. * $p < .05$. χ^2 = Wald test statistic, df = degrees of freedom, OR = odds ratio, and CI = confidence interval.

From Table 3.6, sex and age were conditionally predictive of missing values. In particular, the odds of females having missing data were 1.70 times that of males, 95% CI [1.42, 2.05]. Seniors who were aged above 75 years also tended to have more missing data; the odds of older seniors having missing data were 1.32 times that of younger seniors, 95% CI [1.08, 1.62]. Because the lower bound of this CI is close to 1.00, there is considerable sampling variability around this estimate of OR = 1.32, warranting a non-definitive interpretation (i.e., the statistical information does not warrant a definite conclusion because of high sampling variability). Results from this brief analysis of missing data indicate that results from the primary analysis are not generalizable because females and older seniors tend to have missing data, and were more often excluded from the primary analysis which made use of list wise deletion to handle missing data. Thus, results of the primary analysis may not generalize to females and older adults from the population of seniors exiting casinos.

Primary analysis. A series of logistic regression models were fit to the data with varying sets of predictors, where the probability of the negative outcome (i.e., playing slot machines and EGMs

monthly or more often, spending more than \$1,000 on gambling per year, and problem gambling) was modeled. Depending on the combination of variables in the model, sample size varied by analysis.

Slot machines and EGMs. Table 3.7 presents the results of the logistic regression of playing slot machines and EGMs monthly or more often on the covariates of age and sex, the approach and avoidance motives, and the environmental variables of proximity to closest casino and coming alone versus coming with someone. This analysis is based on $N = 2063$ seniors. All predictors in the model were significant except for the count of approach motives and the avoidance motive of escape or forget worries (see Table 3.7); proximity to closest casino had five levels, with $X^2 (df = 4) = 26.59, p < .0001$.

Controlling for all other variables in the model, old-old seniors were 1.36 times more likely to frequently play slots and EGMs than young-old seniors, 95% *CI* [1.05, 1.78]. Given that the lower bound of the *CI* is close to 1.0, the effect of age on playing slots and EGMs monthly or more frequently is not definitive because the width of the *CI* indicates large sampling variability. Males were $1/0.67 = 1.49$ times more likely to play slots and EGMs monthly or more compared to females 95% *CI* [1.18, 1.89].

Among the person-level variables of gambling motives, seniors who endorsed the avoidance motive item “Because it helps when you are feeling anxious, nervous, or depressed” are 2.17 times more likely to play slot machines and EGMs monthly or more often, 95% *CI* [1.10, 4.26]. Similarly, seniors who endorsed the item “To fill time/boredom” are 1.96 times more likely to play slot machines and EGMs more frequently, 95% *CI* [1.49, 2.56].

Table 3.7: Effects on gambling at slot machines and EGMs monthly or more often versus less often.

Parameter	log-odds	S.E.	$X^2(df = 1)$	<i>p</i> -value	<i>OR</i>	<i>OR</i> 95% <i>CI</i>
Intercept	1.40	0.15	81.70	<.001*		
Old-old vs. young-old	0.31	0.14	5.25	.022*	1.36	[1.05, 1.78]
Female vs. Male	-0.40	0.12	11.19	.001*	0.67	[0.53, 0.85]
Count of approach gambling motives	0.01	0.04	0.12	.726	1.01	[0.94, 1.10]
Escape or forget worries	0.16	0.20	0.59	.443	1.17	[0.79, 1.74]
Helps negative feelings ^a	0.77	0.35	5.01	.025*	2.17	[1.10, 4.26]
To fill time/boredom	0.67	0.14	23.59	<.001*	1.96	[1.49, 2.56]
Proximity 0-10 km vs over 100 km	0.97	0.35	7.64	.006*	2.64	[1.33, 5.27]
Proximity 11-25 km vs over 100 km	0.89	0.35	6.50	.011*	2.44	[1.23, 4.85]
Proximity 26-50 km vs over 100 km	0.76	0.35	4.67	.031*	2.14	[1.07, 4.25]
Proximity 51-100 km vs over 100 km	0.01	0.38	0	.970	1.01	[0.48, 2.14]
Come alone vs. Come with someone	0.38	0.15	6.42	.011*	1.46	[1.09, 1.96]

Note. X^2 = Wald test statistic, *df* = degrees of freedom, *OR* = odds ratio, and *CI* = confidence interval. * $p < .05$. ^aNegative feelings include feeling anxious, nervous, or depressed.

Proximity had a positive effect on frequently playing slots and EGMs in that closer proximity is related to a higher likelihood of frequently playing slots and EGMs. For instance, seniors within 0 to 10 km to the closest casino are 2.64 times more likely to play slots and EGMs more frequently compared to seniors over 100 km away, 95% *CI* [1.33, 5.27]; seniors within 11-25km away are 2.44 times more likely

to play slots and EGMs more frequently than seniors over 100 km away, 95% *CI* [1.23, 4.85]; seniors within 26-50 km away are 2.14 times more likely to play slots and EGMs more frequently than seniors over 100 km away, 95% *CI* [1.07, 4.25]. This last effect cannot be interpreted definitively because the lower bound of the *CI* is close to the null value of 1.0; the sampling variability associated with the estimate does not warrant a strong conclusion. There was no evidence to suggest a difference between being located 51-100 km versus over 100 km on seniors' likelihood of frequently playing slots and EGMs.

Finally, seniors who came alone to the casino were 1.46 times more likely to play slots and EGMs more frequently compared to seniors who came with someone, 95% *CI* [1.09, 1.96]. The effect of coming alone to the casino and using slots and EGMs monthly or more frequently to gamble cannot be interpreted definitively because the lower bound of the *CI* is close to the null value of 1.0. There were no person-level by environment-level interactions which were significant.

Gambling expenditure. Table 3.8 presents the results of the logistic regression of annual gambling expenditure of more than \$1,000 on the covariates of sex; the person variables on opinions about the legality of gambling, approach and avoidance gambling motives, and playing slots or EGMs frequently; and the environmental variables of coming to the casino as part of an organized group, and coming to the casino alone. This analysis is based on *N* = 1793 seniors. The two-way person-level by environment-level variable interactions were not significant and not reported.

Controlling for all variables in the model, males were 1.23 times more likely than females to spend \$1,000 or more annually gambling. However, this effect is not definitive because the 95% *CI* [1.00, 1.51] is extremely close to the null value of 1.0 after rounding.

Table 3.8: Effects on gambling expenditure of \$1,000 or more per year versus less than \$1,000.

Parameter	log-odds	S.E.	$\chi^2(df = 1)$	<i>p</i> -value	<i>OR</i>	<i>OR</i> 95% <i>CI</i>
Intercept	-1.74	0.18	91.57	<.001*		
Female vs. Male	-0.21	0.10	3.98	.046*	0.81	[0.66, 1.00]
All types legal vs. some types legal	-0.27	0.11	6.66	.010*	0.76	[0.62, 0.94]
All types legal vs. all types illegal	-0.50	0.24	4.33	.038*	0.60	[0.38, 0.97]
Count of approach gambling motives	0.11	0.03	11.77	.001*	1.12	[1.05, 1.20]
Escape or forget worries	0.33	0.16	4.19	.041*	1.39	[1.01, 1.90]
Helps negative feelings ^a	0.001	0.22	0	.996	1.00	[0.65, 1.55]
To fill time/boredom	0.50	0.11	21.36	<.001*	1.65	[1.34, 2.04]
Come with organized group vs. not	-0.79	0.26	9.25	.002*	0.46	[0.28, 0.76]
Come alone vs. Come with someone	0.41	0.12	12.71	<.001*	1.51	[1.20, 1.90]
Play slots/EGMs monthly or more	1.17	0.16	51.93	<.001*	3.22	[2.34, 4.42]

Note. χ^2 = Wald test statistic, *df* = degrees of freedom, *OR* = odds ratio, and *CI* = confidence interval. **p* <.05. ^aNegative feelings include feeling anxious, nervous, or depressed.

The extent to which gambling should be legal had an effect on gambling expenditure of \$1,000 or more per year versus less than \$1,000 per year, $\chi^2(df = 2) = 9.05$, *p* = .011. Inverting the *OR*s in Table 3.8, seniors who indicate that some types of gambling should be legal over all types should be legal are

1.31 times more likely to spend \$1,000 or more annually on gambling than not, 95% *CI* [1.07, 1.62]. Similarly, seniors who indicate that all types of gambling should be illegal over all types should be legal are 1.66 times more likely to spend \$1,000 or more annually on gambling than not, 95% *CI* [1.03, 2.67]. Taken together, after controlling for all other variables in the model, more negative views of whether gambling should be legal is predictive of spending \$1,000 or more per year versus spending less than \$1,000. This effect on attitudes toward the legality of gambling on gambling expenditure, however, is not definitive given that the *CI*s are close to the null value of 1.0.

Additionally, there were positive effects of approach motives and the avoidance motives of gambling “To escape or forget worries” and gambling “To fill time/boredom”. Seniors who endorse one type of approach motive more than others are 1.12 times more likely to spend \$1,000 or more on gambling yearly, 95% *CI* [1.05, 1.20]. The effect of the avoidance gambling motives is larger than the approach motives. Seniors who endorse the item “To escape or forget your worries” are 1.39 times more likely to spend \$1,000 or more annually on gambling than seniors who do not endorse this avoidance motive, 95% *CI* [1.01, 1.90]. Similarly, seniors who endorse the item “To fill time/boredom” are 1.65 times more likely to spend \$1,000 or more on gambling annually, 95% *CI* [1.34, 2.04]. It is noted that the effect of the count of approach motives and the avoidance motive of escaping worries are less definitive than the avoidance motive of filling time or boredom, as indicated by their 95% *CI*s.

In terms of environment-level variables, coming with an organized group and coming alone had an effect on gambling expenditure. Specifically, seniors who did *not* come with an organized group are $1/0.46 = 2.19$ times more likely to spend \$1,000 or more on gambling per year, 95% *CI* [1.32, 3.64]. Similarly, seniors who came alone to the casino are 1.51 times more likely to spend \$1,000 or more per year on gambling, 95% *CI* [1.20, 1.90].

Finally, playing slots or EGMs monthly or more often was predictive of spending more than \$1,000 per year on gambling. Seniors who reported playing slots or EGMS frequently were 3.22 times more likely to have an annual gambling expenditure of \$1,000 or more compared to seniors who do not play slots or EGMs often, 95% *CI* [2.34, 4.42].

In general, the effects of the person-level variables in predicting gambling expenditure were smaller compared to the environment-level variables, except for the endorsement of avoidance motives of filling time or boredom. The behavior of playing slots or EGMs monthly or more often was the predictor with the largest effect on spending more than \$1,000 per year on gambling.

Problem gambling. Table 3.9 presents the results of the logistic regression of problem gambling on the covariates of age, being married, being employed, being born outside of Canada; the person-level variables of seniors’ opinions on the legality of gambling, the harms versus benefits of gambling, and approach and avoidance motives; the environmental variable of coming alone; and, the variables of playing slots or EGMs monthly or more often and spending more than \$1,000 annually on gambling. This analysis is based on $N = 1401$ seniors.

Table 3.9: Effects on problem gambling (PGSI total score > 8 versus ≤ 8).

Parameter	log-odds	S.E.	$\chi^2(df = 1)$	p -value	OR	OR 95% CI
Intercept	-4.93	1.08	20.67	<.001*		
Old-old vs. young-old	-0.24	0.38	0.40	.526	0.79	[0.38, 1.65]
Married vs. not Married	-0.70	0.31	5.12	.024*	0.50	[0.27, 0.91]
Employed vs. not Employed	1.20	0.33	13.07	<.001*	3.33	[1.74, 6.40]
Born out of vs. Born in Canada	0.49	0.31	2.59	.108	1.64	[0.90, 2.98]
All types legal vs. some types legal	-0.57	0.32	3.11	.078	0.57	[0.30, 1.07]
All types legal vs. all types illegal	0.35	0.46	0.57	.451	1.42	[0.57, 3.51]
More harms vs. equal harms and benefits	-1.63	0.35	22.43	<.001*	0.20	[0.10, 0.38]
More harms vs. less harms	-2.97	0.77	14.94	<.001*	0.05	[0.01, 0.23]
Count of approach gambling motives	-0.19	0.10	3.69	.055	0.83	[0.68, 1.00]
Escape or forget worries	1.15	0.36	10.16	.001*	3.16	[1.56, 6.40]
Helps negative feelings ^a	1.21	0.44	7.55	.006*	3.36	[1.42, 7.98]
To fill time/boredom	-0.15	0.31	0.22	.638	0.86	[0.47, 1.59]
Come alone vs. Come with someone	0.48	0.31	2.38	.123	1.61	[0.88, 2.96]
Play slots/EGMs monthly or more	2.31	1.03	5.00	.025*	10.04	[1.33, 75.81]
Spend more than \$1,000 on gambling	0.78	0.31	6.34	.012*	2.18	[1.19, 3.99]

Note. χ^2 = Wald test statistic, df = degrees of freedom, OR = odds ratio, and CI = confidence interval. * p <.05. ^aNegative feelings include feeling anxious, nervous, or depressed.

The covariates of being married and employed are negative predictors of problem gambling. The person-level variables of attitudes towards the harms versus benefits of gambling; and the avoidance motives of escape to forget worries and helps with feeling anxious, nervous or depressed also statistically significantly predicted problem gambling. Finally, the behaviors of playing slots or EGMs monthly or more often and spending \$1,000 or more annually on gambling are predictors of problem gambling.

Controlling for all the variables in the model, being married was protective against problem gambling. Seniors who were not married were 2.02 times more at risk of being problem gamblers compared to seniors who are married or equivalent, 95% CI [1.10, 3.70]. Not being employed was also protective against problem gambling. Seniors who were employed were 3.33 times more at risk of being problem gamblers compared to unemployed seniors, 95% CI [1.74, 6.40].

The person-level predictor of attitudes about legalizing types of gambling was not predictive of problem gambling, $\chi^2(df = 2) = 5.31, p = .070$. Conversely, attitudes about the harms of gambling had a negative effect of problem gambling, $\chi^2(df = 2) = 32.52, p < .001$. Contrary to the reported marginal effects, more harm was associated with less risk of problem gambling. In particular, seniors who indicated that gambling had equal harms and benefits versus had more harms than benefits were 5.13 times more at risk of being problem gamblers, 95% CI [2.60, 10.10]. Seniors who indicated that gambling

had more benefits than harms versus more harms than benefits were 19.23 times more at risk of being problem gamblers, 95% *CI* [4.31, 90.01]. This latter effect of attitudes toward the harms of gambling should be interpreted with some caution given the uncertainty of estimation seen in the large 95% *CI*.

Two types of avoidance motives were also predictive of problem gambling, above and beyond the other predictors in the model. Seniors who endorsed “To escape or forget worries” were 3.16 times more likely to be problem gamblers, 95% *CI* [1.56, 6.40]. Seniors who endorsed “Because it helps when you are feeling anxious, nervous, or depressed” were 3.36 times more at risk to be problem gamblers, 95% *CI* [1.42, 7.98].

Finally, the two gambling behaviors were predictive of problem gambling. Seniors who play slots or EGMs monthly or more often were 10.04 times at risk of being problem gamblers, 95% *CI* [1.22, 75.81], after controlling for all predictors in the model. The wide 95% *CI* is indicative of estimate imprecision, likely due to sparseness because 702 participants had missing data and were excluded from analysis. Additionally, seniors who spend \$1,000 or more annually on gambling are 2.18 times more at risk at being problem gamblers, 95% *CI* [1.19, 3.99]. Two-way person-by-environment interactions were examined but were not significant and excluded in the final results.

In general, person-level predictors involving attitudes toward gambling and avoidance motives were predictive of problem gambling. Additionally, the gambling behaviors of playing slots or EGMs monthly or more frequently and spending more than \$1,000 annually on gambling had large effects on problem gambling.

Who can use the results of your analysis?

The results obtained from the current secondary analysis of the Ontario Seniors Gambling study provide a powerful snapshot of the population of seniors who gamble at Ontario casinos – information that is valuable to a wide variety of users. Specifically, the results can be used by the Ontario Lottery and Gaming Corporation (OLG), and by policy makers, researchers, and knowledge transfer experts throughout Canada, as well as internationally. The findings are of direct relevance to Canadian seniors and their communities. In particular, they highlight the importance of raising seniors’ awareness of the relative risks associated with playing slots or EGMs and with gambling as a strategy to escape problems.

How did the secondary analysis of the data move the research forward?

The secondary analysis differed from a previous analysis of the Ontario Seniors Gambling dataset (McCready et al., 2014) in its objective and its methodological approach. In terms of its objective, the secondary analysis sought to examine the conditional effect (i.e., controlling for other variables) of sets of predictors falling into two broad categories: person-level and environment-level variables on gambling related outcomes. While not wedded to a specific psychological theory, this approach is based on the assumption that behavioural choices emerge from complex effects of individuals and their environments. Methodologically, the secondary analysis followed a rigorous two-step procedure, in which candidate predictors and covariates were examined in preliminary analyses prior to inclusion in the logistic regression models which tested the research question. Overall, this approach represents a compromise between data-driven exploration and conceptually motivated hypothesis testing.

The results of the secondary analysis replicated many findings reported by McCready et al. (2014), as well as by other researchers working with different datasets. The socio-demographic variables included as covariates in the logistic regression models were statistically predictive of gambling outcomes. However, these associations differed between outcomes. Older age and male sex were predictive of playing slots and EGMs; male sex was associated with higher gambling expenditures; and being young-old (i.e., aged 55 to 74 years), unmarried, employed, and being born outside of Canada were predictive of problem gambling. This heterogeneity suggests that there is no simple demographic profile of at-risk gamblers among older casino patrons.

The results indicated that gambling motives (a person-level factor) were consistently statistically significant predictors of the three outcomes of playing slots and EGMs, gambling expenditure, and problem gambling. Recall that the preliminary analysis included a series of factor analyses on the set of gambling motives so as to identify clusters of approach and avoid motives, which are consistent with the literature on age-related changes in motivational orientation (e.g., Carstensen et al., 1999; Ebner et al., 2006). There was moderate support for this distinction, with one cluster of motives broadly reflecting socially acceptable, approach motives, and the second set of less socially desirable motives which aligned with avoidance themes (also described as coping strategies by McCready et al., 2014). The latter set of motives, while not widely endorsed or reliable together as a single factor, turned out to be highly or moderately predictive of all three risky gambling outcomes when analyzed separately. Perhaps most importantly, socially undesirable avoidance-type motives were the person-level predictors with large effects on frequent slot machine and EGM playing and problem gambling. This suggests that seniors who endorse socially undesirable avoidance motives of escaping boredom or alleviating negative feelings may be especially vulnerable and at risk of problem gambling. Conversely, endorsing approach motives was also relevant in that it was strongly associated with increased gambling expenditures.

Beliefs and attitudes about gambling were not statistically significant predictors of gambling outcomes, with the exception of the belief that the benefits of gambling outweigh the harms. Endorsement of this view was strongly associated with problem gambling. Stated differently, problem gamblers tend to believe that benefits of gambling outweigh its harms, after controlling for other predictors (e.g., gender, age, motives). Given the cross-sectional design of this study, the directionality of this effect is unclear and seniors' belief in the harms versus benefits of gambling could either be a cause of their gambling behaviour or a manifestation of an attempt to rationalize this behaviour.

Playing slot machines and EGMs was statistically predictive of high gambling expenditure (spending \$1,000 or more on gambling per year) as well as of problem gambling. This result corroborates past research showing that slots and EGMs, which are games of chance rather than skill (Wiebe et al., 2004), are associated with risky gambling among seniors (e.g., Clarke, 2008; Levens et al., 2005). Those who play slot machines or games of chance are also more likely to be susceptible to *gambler's fallacy* (Crosen & Sundali, 2005), a cognitive illusion in which random outcomes are believed to be systematic and predictable. Future research should explore whether the association between playing slots and EGMs and problem gambling among seniors can be explained by age-related cognitive impairment. Finally, the current results also show that annual gambling expenditures of over \$1,000 predict problem gambling. This finding is consistent with research showing that in 2012, 24.1% of Ontario's gambling revenues came from problem and pathological gamblers (Williams & Volberg, 2013).

Among the environmental predictors examined, geographic proximity was a statistically significant predictor of playing slots and EGMs. This resonates with prior evidence showing that access to gambling venues is a principal contributor to problem gambling (Winters, Bengston, Dorr, & Stinchfield, 1998). Seniors living within 0 to 10 km from the nearest casino were 2.64 times more likely to be frequent slot and EGM players, compared with those living over 100 km away. While the impact of geographic factors is not surprising, it does highlight the fact that new casino construction can be expected to have significant effects on the incidence of risky gambling behaviours among seniors living in communities located in close proximity to the casino.

The environmental factor of attending a casino alone was a statistically significant predictor of the gambling outcomes of playing slots and EGMs and gambling expenditure. The reasons underlying why visiting a casino alone is predictive of playing slots and EGMs and increased gambling expenditure is complex. For instance, visiting a casino alone may be a symptom of a confounding variable such as social isolation, which could lower the threshold for these gambling-related behaviors. Conversely, there may also be a protective effect to visiting casinos in groups. Research has shown that people tend to adjust their behaviour to conform to other group members (Fowler & Christakis, 2010; Hermans, Lichtwarck-Aschoff, Bevelander, Herman, Larsen, & Engels, 2012). Group conformity may help keep risky impulses in check, and may also encourage involvement in social games (e.g., cards) associated with less spending than slot machines and EGMs. Disentangling the different mechanisms through which the social context of casino visits affects risky gambling outcomes is a challenge for future research.

Please explain the importance of your findings within an Ontario context?

The Ontario government is expanding the number of casinos across the province to generate an additional \$4.6 billion in net revenue between 2012 and 2018 (OLG, 2012). As part of these changes, OLG has been expanding sectors such as internet and charitable gaming, which are likely to attract older customers. The current findings highlight the need for close attention to risks posed to seniors in Ontario. In particular, the results suggest that employed and unmarried seniors who visit casinos alone and endorse socially undesirable avoidance motives related to gambling are at greater risk of problem gambling. Increased access to slots and EGMs, in particular, may lead to increased gambling expenditures and may raise the incidence of problem gambling. Greater use of slots and EGMs, in turn, can be expected particularly in communities located in close vicinity to gambling venues. The current findings indicate that continued investment into research and knowledge exchange or translation regarding seniors gambling in Ontario is critical to inform the development of related social policies.

Any other results or highlights that were not already captured in this report?

None

Section 4: References

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