2015

QUINTE LONGITUDINAL STUDY OF GAMBLING AND PROBLEM GAMBLING

Robert J. Williams, University of Lethbridge
Robert Hann, Robert Hann & Associates Limited
Donald Schopflocher, University of Alberta
Beverly West, University of Lethbridge
Patricia McLaughlin, Robert Hann & Associates Limited
Nick White, Robert Hann & Associates Limited
Kate King, Robert Hann & Associates Limited
Trevor Flexhaug, University of Lethbridge

REPORT PREPARED FOR THE ONTARIO PROBLEM GAMBLING RESEARCH CENTRE

2/20/2015

Citation

Contact Information

Dr. Robert J. Williams
Professor, Faculty of Health Sciences &
Coordinator, Alberta Gambling Research Institute
University of Lethbridge
Lethbridge, Alberta, Canada
T1K 3M4
403-382-7128
robert.williams@uleth.ca

Mr. Robert Hann
President
Robert Hann & Associates Limited
806592 25th Sideroad
Box 62, Heathcote, Ontario, Canada
N0H 1N0
519-599-6470
hannbob@ican.net

Companion Report

Acknowledgements

Contents

SUMMARY

The Quinte Longitudinal Study (QLS) is a prospective study of gambling and problem gambling conducted in the Quinte region of Ontario, Canada from 2006 to 2011. A sample of 4,121 adults, 17 and older, was recruited via random digit telephone dialing with 26% of the sample overselected for higher levels of gambling involvement. The sample was roughly representative of the demographic profile of the Canadian adult population, and the geographic region had very similar gambling opportunities to the rest of Canada. The cohort was assessed annually over 5 years. Assessments were computerized and self-administered and were completed either online at the person's home or at the QLS office in Belleville. The assessment collected comprehensive information on demographics, gambling behaviour, physical health, mental health, substance use and abuse, stressors, personal values, social functioning, personality, leisure activity, and intelligence. An exceptionally high retention rate of 93.9% after 5 years was achieved.

The QLS had 4 main research questions:
1. What are the normal patterns of continuity and discontinuity in gambling and problem gambling over time?
2. What individual, social, and structural variables mediate the development of responsible gambling and problem gambling?
3. What etiological model of gambling and problem gambling emerges from these findings?
4. What are the implications of these results for the prevention of problem gambling?

A very similar longitudinal study was conducted in the same time period in Alberta, namely the Leisure, Lifestyle, and Lifecycle Project (LLLP). A set of parallel analyses was conducted on the LLLP dataset in order to identify findings that were robustly supported in both studies. The collective findings of the QLS and LLLP studies represent the most comprehensive longitudinal analysis of gambling and problem gambling currently in the literature.

Stability of Gambling and Problem Gambling

Consistent with prior research, the stability of gambling and problem gambling symptomatology over time was strongly related to current level of gambling involvement and problematic gambling. Non-Gamblers and Recreational Gamblers, who constitute the large majority of the general population, had very stable behavioural patterns, with a slight majority of Non-Gamblers continuing to be Non-Gamblers over a 5 year period and the large majority of Recreational Gamblers continuing to be Recreational Gamblers over a 5 year period.

In contrast, people with sub-clinical levels of problem gambling symptomatology ('At Risk Gamblers') had an unstable pattern, with only a minority of people continuing to be in this category in the next assessment and only 6.7% continuing in this category for 5 consecutive years. Although a significant percentage of At Risk Gamblers subsequently become Problem

Gamblers (14.7%), a much more common route was transitioning back to Recreational Gambling.

Problem gambling had similar levels of instability to At Risk Gambling. One year was the modal duration of Problem Gambling, occurring in about half of problem gamblers. A longer duration did occur in some people, with 37% of Problem Gamblers being in this category for 2 or more consecutive time periods. However, chronic unremitting problem gambling over 4 or more years was very uncommon. Risk of chronic problem gambling was observed to increase with each consecutive year of problem gambling status. The relatively short episode duration for most problem gamblers also meant that recovery rates tended to be high, with about 80% of problem gamblers having at least one year of recovery in a 5 year period. Of those that recovered, about 25% relapsed in the year following the recovery year, with relapse increasing to 30% within 2 years and 40% within 3 years. The longer term relapse rate beyond this time frame is unknown, but is expected to be significantly higher than 40%. Related to the above findings, rapid cycling in and out of problem gambling was uncommon, with less than 14% of problem gamblers repeatedly cycling in and out of problem gambling in a 5 year time period.

More severe forms of problem gambling (i.e., pathological gambling) were observed to have very similar patterns of episode duration, chronicity, recovery, and relapse to less severe forms when the definition of stability was that the person was still in the severe or 'pathological' category. However, when recovery was defined as not evidencing *either* problem or pathological gambling, then a more chronic and stable course was evident. In this case, the majority of people had episode durations between 2 and 5 years. Furthermore, recovery rates were lower and propensity for relapse was higher.

Prediction of Future Problem Gambling

No single variable was overwhelmingly present in people who subsequently become problem gamblers and absent in people who do not become problem gamblers. Rather, there were many different variables that each increased risk of future problem gambling and were present to differing degrees in future problem gamblers. However, there were categories of variables that were more predictive, and stronger variables within each of these categories. *Gambling-related* variables were most robustly predictive of future problem gambling, with almost all of the strongest individual variables also being in this category.

Univariate analyses established that being an At Risk or Problem Gambler was the best single predictor of being a problem gambler in a future assessment. Intensity of overall gambling involvement was the next strongest predictor, as measured by total gambling expenditure, overall frequency of gambling, total time spent on gambling, and/or total number of gambling formats engaged in. Higher frequency of involvement in continuous forms of gambling (i.e., electronic gambling machines (EGMs), casino table games) was the third strongest predictor. Other important gambling-related predictors were: experiencing a big gambling win in the past year; gambling being identified as a top leisure pursuit; having family members and/or friends

who were regular gamblers or problem gamblers; gambling 'to escape' or 'to win money'; and having more gambling fallacies.

Personality was the next most important category of variable predictive of future problem gambling in the univariate analyses. Impulsivity was the strongest predictor in this category as well as one of the strongest variables across all categories. Three other personality attributes also had fairly strong and consistent predictive power: vulnerability (to stress), lower agreeableness, and lower conscientiousness. Depression was the strongest predictor within the mental health category. Other important mental health predictors were: the presence of anxiety-related disorders, substance abuse, having a behavioural addiction, and having a lifetime history of addiction to drugs/alcohol or mental health problems. Several other variables from different categories had consistent, but lower predictive power: a greater number of stressful events in the past year, a lower intelligence quotient (IQ), lower educational attainment, lower happiness, higher stress, a history of child abuse, antisocial traits, and having a physical disability and/or a lower physical health rating.

Multivariate analyses were able to account for between 69% to 90% of the variance at each time period, suggesting that the results potentially provide a fairly comprehensive explanation of the elements contributing to the future onset of problem gambling. Many univariate predictors were not significant in the multivariate analyses due to having overlapping predictive power. Similar to what was found in the univariate analyses, being in the At Risk or Problem Gambler category was the strongest multivariate predictor of future problem gambling. Several other gambling-related variables contributed additive predictive power: having a big win in past year; increased frequency of electronic gambling machine and/or casino table game participation; family members being regular gamblers; having close friends/family with gambling problems; gambling to escape or to win money; having more gambling fallacies; gambling being identified as a top leisure pursuit; and engaging in a larger number of gambling formats. Beyond these gambling-related variables, the only other variables robustly adding multivariate predictive power were: impulsivity, having a behavioural addiction, a lifetime history of addiction to drugs or alcohol, and a family history of mental health problems.

The above analyses do not distinguish between variables predicting first onset of problem gambling, versus relapse back to problem gambling following recovery, versus continued problem gambling from the previous assessment. Supplemental analysis established that almost all gambling-related predictors tended to predict first onset problem gambling. The exceptions to this were that proximity to electronic gambling machine (EGM) venues and being in the At Risk or Problem Gambling category were stronger predictors of problem gambling continuation and relapse rather than first onset problem gambling. Several personality, mental health, stress-related, cognitive, and physical health variables were also implicated in first onset problem gambling. However, in general, these types of variables tended to be even more strongly implicated in problem gambling continuation and relapse.

Most predictors appear to create enduring risk for problem gambling at *all* future time periods, rather than some creating imminent risk and others creating risk that takes years to manifest

itself. However, there were a few variables that reliably preceded the onset of problem gambling and were also significantly stronger predictors of imminent problem gambling than other variables. The strongest and most consistent predictor of problem gambling in the next assessment was intensive gambling involvement. Other strong and consistent predictors were having a big gambling win in the past year and gambling being a top 5 leisure pursuit. The strongest and most consistent non-gambling related variables were impulsivity and major depressive disorder. Although there were no variables that only predicted problem gambling in the distant future, all significant predictors that are invariant over time (e.g., personality, educational attainment, intelligence, family history, etc.) create a more long-term risk.

There was only limited overlap between problem gamblers' self-reports of what they believed the cause(s) of their problem gambling to be compared to the empirically identified predictors. Most problem gamblers identified a singular cause for their problems whereas the empirical results suggest that a large number of variables are usually involved. Self-reported causes also tended to focus primarily on psychological, motivational, and social influences (e.g., gambling to escape or to win money, boredom, stress/depression, social pressure to gamble). While most of these reported causes were corroborated by the empirical findings, problem gamblers appeared to be less aware of the role of broader contextual determinants such as past history of gambling problems, family history of gambling, engagement in continuous forms of gambling, having a big win, gambling fallacies, personality, substance abuse, and mental health problems.

Etiological Model of Gambling and Problem Gambling

The present results indicate that problem gambling has a biopsychosocial etiology with multiple risk and protective factors. The particular pattern of risk factors tends to be different between different problem gamblers, but many of the strongest risk factors tend to be fairly prevalent.

Prior research as well as the present findings indicate that a significant portion of future problem gamblers have an inherited shared propensity for gambling, problem gambling, and problem gambling comorbidities (i.e., substance abuse, antisocial personality, mood disorders). The behavioural manifestations of this propensity include impulsivity as well as a preference for risk-taking activities such as gambling. Male gender and younger age are additional attributes that increase propensity for risk taking (and gambling) independent of any specifically inherited propensity. Propensity for impulsivity and risk taking leads to higher rates of substance abuse and antisociality, which are risk factors for stress and mood disorders. All of these factors are direct risk factors for problem gambling, primarily through facilitation of relapse and/or problem gambling continuation. Problem gambling, in turn, is a contributing factor to mental health problems, substance abuse, stress, and antisocial behavior. This bidirectional relationship results in high rates of co-occurrence.

Environmental factors have an equally important and more universal influence on the development of problem gambling. There are as many environmental contributions to substance use/abuse, antisociality, stress, and mental health problems as there are endogenous

contributions. Having an adverse childhood is one of the more important factors. Parental, familial, or peer modelling of gambling and/or problem gambling are also important contributors to both gambling and problem gambling by their normalization of these activities as well as introducing the person to gambling at a younger age. Other important environmentally-based risk factors include: gambling being readily available, having more gambling fallacies, lower educational attainment, and lower intelligence (intelligence also having a significant biological basis). All of these variables are direct risk factors for gambling, heavy gambling, and problem gambling. That being said, they tend to be stronger direct predictors of heavy gambling than problem gambling.

High levels of gambling expenditure, frequency, time, number of formats, and/or involvement in continuous forms (e.g., EGMs) ('heavy gambling') creates the greatest direct risk for problem gambling, as it immediately precedes problem gambling in the large majority of cases. Heavy gambling involvement also increases the likelihood of a big win, which is an important independent risk factor for problem gambling.

Recovery from problem gambling is common, with the modal episode duration being only one year. However, relapse is also common, with past history of problem gambling being the strongest predictor of relapse as well as the strongest predictor of problem gambling continuation. Other important relapse and continuation risk factors include the presence of certain personality traits (vulnerability, lower agreeableness, lower conscientiousness), antisociality, comorbid mental health disorders, a lifetime history of mental health or substance abuse problems, lower intellectual ability, antisociality, and physical health problems.

Implications for the Prevention of Problem Gambling

1. The present findings confirm much of the previous research concerning the predictors of future problem gambling. Consequently, their main value is providing a more solid scientific footing for prior recommendations concerning how to best prevent problem gambling (e.g., Williams, West & Simpson, 2012) as well as providing a better understanding of the *relative importance* of these predictors as well as their specific etiological role in first onset, relapse, and/or problem gambling continuation.
2. There is no 'silver bullet' to prevent problem gambling. Rather, a wide array of educational and policy initiatives is needed to address the multi-faceted biopsychosocial etiology of problem gambling. The effectiveness of any single prevention initiative will be modest, but coordinated efforts can potentially have synergistic effects.
3. Generic school-based prevention programs targeting a wide range of problems are efficient and effective due to a) problem gambling's shared genetic vulnerability with substance abuse, mood disorders, and antisociality; and b) because these conditions are also independently caused by many of the same risk factors.
4. Because of their etiological connection, effective treatment of substance abuse and/or mood disorders will also help reduce the future incidence of problem gambling. Because of their even more important role in problem gambling continuation and relapse, comorbid

mood disorders and substance abuse need to be routinely evaluated and concurrently treated in all problem gamblers presenting for treatment.

5. Many risk factors for problem gambling have a significant biological basis, making them difficult to address. However, people with these biological vulnerabilities tend to be more concentrated in lower socioeconomic neighbourhoods. Hence, not placing gambling opportunities in these types of neighbourhoods is one way of addressing these biological vulnerabilites.

6. Most of the modifiable risk factors for problem gambling are gambling-related, which is fortunate, as heavy gambling involvement is also the final common pathway for all future problem gamblers.

   a) Continuous forms of gambling (electronic gambling machines, casino table games) should be eliminated, reduced in number, or constrained in how they operate.

   b) Policies are needed to curtail risky gambling practices. This includes policies directed at the risky practices identified in the present study (i.e., eliminating 'gambling reward programs' or using these programs to reward responsible gambling; restricting or eliminating automatic teller machines (ATMs) in gambling venues; preventing tobacco use in gambling venues) as well as policies that have been shown to be effective in other research (i.e., mandatory player pre-commitment, operator-imposed maximum loss limits, automated intervention to alert players to risky behavioural patterns).

   c) Reducing the general availability of gambling will have a modest impact on decreasing the initial onset of problem gambling, and a more important role in reducing relapse. Reduced availability can be accomplished by reducing the number of gambling venues, density of gambling opportunities within these venues, restricting gambling opportunities to dedicated gambling venues, reducing hours of operation, reducing the number of gambling formats available, and not providing convenient 24 hour online gambling opportunities.

   d) Educational efforts are needed to promote knowledge, motivations, and attitudes conducive to responsible gambling. Addressing gambling fallacies and inappropriate motivations for gambling (to escape or to win money) are particularly important. Additionally, information should be provided concerning: signs and symptoms of problem gambling, elevated risks of continuous forms of gambling, the facilitative effect of associating with heavy gamblers and/or problem gamblers, normative levels of time and money on gambling, true odds of gambling games and their negative mathematical expectation, gambling practices that increase risk, where to go for help, and low risk guidelines that predict problem-free gambling. With respect to this last point, the predictive power of existing low-risk guidelines (that focus on gambling expenditure) could be significantly improved with the addition of variables demonstrated to have additive predictive power: past history of problem gambling; higher frequency of involvement in EGMs and/or casino table games; having family members and/or close friends that are regular or problem gamblers; having a big gambling win in the past year; higher levels of gambling fallacies; using gambling as a way of escaping from problems; and having a history of impulsivity.

INTRODUCTION

There has been a dramatic worldwide expansion of legalized gambling since the late 1980s. The overall social and economic costs and benefits of this expansion are mixed (Williams, Rehm & Stevens, 2011). However, what is clear is that one of the primary negative impacts of widely available gambling opportunities is the development of disordered gambling in a minority of people. Various terms have been use to describe disordered gambling, including 'compulsive gambling', 'addictive gambling', 'problem gambling', and 'pathological gambling'. The term used in the present document is '**problem gambling'**. The definition of problem gambling put forward by Neal, Delfabbro & O'Neil (2005) captures the essential elements of this phenomenon common to almost all definitions: *"Problem Gambling is characterized by difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community."* Essentially, a problem gambler is someone with a pattern of excessive gambling; impaired control over their gambling behaviour; significant negative consequences deriving from this impaired control; and persistence despite these negative consequences. Problem gambling is assumed have varying degrees of severity, ranging from mild, moderate to severe. The term '**pathological gambling'** is synonymous with the most severe forms of problem gambling.[1]

Depending on the year and the particular jurisdiction, the past year prevalence of problem gambling ranges from 0.5% to 7.6% of the adult population (Williams, Volberg & Stevens, 2012). Problem gambling is associated with a range of negative consequences for the individual, his/her family, and for society in general. *Financial difficulties* tend to be the most common type of problem. A significant percentage of problem gamblers will eventually file for bankruptcy (Petry, 2005; Williams, Rehm & Stevens, 2011). *Mental health problems* in the form of guilt, depression and anxiety are also common. Problem gamblers have a significantly elevated risk for suicide attempts and suicide (National Research Council, 1999; Williams, Rehm & Stevens, 2011 (Las Vegas has had the highest per capita rate of suicide in North America for many years). A small percentage of problem gamblers will develop stress-related *physical health problems* either in addition to or instead of mental health problems (i.e., high blood pressure, ulcers). Some problem gamblers experience *difficulties at work or school* because of their gambling. Poorer grades or reduced work productivity is not uncommon, and school failure or job loss sometimes occurs (National Research Council, 1999; Petry, 2005). *Criminal activity* to finance gambling (typically fraud or embezzlement) occurs in a minority of problem gamblers (National Research Council, 1999; Williams, Belanger & Arthur, 2011; Williams, Rehm & Stevens, 2011). Upward of 33% of prison inmates have histories of problem gambling

---

[1] 'Pathological gambling' is a less common term that is used primarily in the United States, due to the fact that 'pathological gambling' was the term used for many years in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) produced by the American Psychiatric Association. 'Problem gambling' is the preferred term because it has less etiological connotations (i.e., 'pathological' means 'disease-like') and because pathological gambling in DSM-IV is dichotomous, whereas evidence indicates that disordered gambling lies on a continuum. Most people now use the term 'pathological gambling' to denote 'severe problem gambling'. Note: 'disordered gambling' is the term now used in DSM-V.

(Williams, Royston & Hagen, 2005). Problem gamblers typically have conflicts with family and/or friends over their gambling behaviour. These conflicts often lead to *relationship problems* (with the person's spouse, children, and friends), sometimes lead to divorce, sometimes lead to domestic violence, and sometimes lead to child abuse and neglect. These problems, in turn, can produce depression, anxiety, and poorer mental health in the spouse and children. There is also an inter-generational impact, as children who have a parent who is a problem gambler are at high risk for developing problem gambling themselves (Kalischuk et al., 2006; Shaw et al., 2007).

A considerable amount of effort is currently being put into the development of strategies to prevent problem gambling. Unfortunately, it is fair to say that the majority of these initiatives have been ineffectual (Williams, West & Simpson, 2012). This situation is partly due to the fact that most of these educational and policy initiatives have been put in place by government and industry because they 'seemed like good ideas' and/or were being used in other jurisdictions, rather than having demonstrated scientific efficacy or being derived from a good understanding of effective prevention practices. However, it is also due to the fact that there is no comprehensive and well established etiological model of problem gambling to guide these efforts. Knowing how and where to effectively intervene hinges on having research that clearly identifies the variables that are etiologically involved in problem gambling, their temporal sequence, and their causal connections.

Correlates of Problem Gambling

There are many cross-sectional studies that have identified correlates of problem gambling. These correlates are as follows:

- Male gender
- Young age (18 – 25)
- Less education or poor school performance
- Lower income
- Non-Caucasian or a member of a minority group
- Abusive or neglectful upbringing
- Family history of gambling and/or problem gambling
- Early onset of gambling
- Peer group or friends involvement in gambling
- Poorer physical health
- Impulsivity, risk-taking, and attentional problems
- Neuroticism, lower agreeableness, and lower conscientiousness
- Conduct disorder and/or antisocial personality
- Significant stressors and/or poor support systems
- Substance use and abuse
- Mental health problems (particularly mood and anxiety disorders)
- Cultural tradition of gambling

- Greater intensity of gambling involvement as measured by higher frequency, expenditure, and number of formats engaged in
- Experiencing a 'big win'
- Engaging in 'continuous' forms of gambling (e.g., electronic gambling machines) that provide a high frequency of reinforcement
- Internet gambling
- Gambling opportunities being readily available
- Gambling fallacies
- Gambling serving a psychological need (i.e., escape; money being an important goal or measure of success to the individual)

Afifi et al., 2010a, 2010b; Alegria et al., 2009; Bagby et al., 2007; Blanco et al., 2006; Blaszczynski & McConaghy, 1994; Blaszczynski & Nower, 2010; Breyer et al., 2009; Carlton et al., 1987; Clark, Nower & Walker, 2013; Coman, Burrows & Evans, 1997; Crockford & el-Guebaly, 1998; Bunningham-Williams et al., 2005; Dowling, Smith & Thomas, 2005; Eisen et al., 1998; el-Guebaly & Hodgins, 2000; el-Guebaly et al., 2006; Feigelman, Gorman & Lesieur, 2006; Fong, Law & Lam, 2014; Gaboury & Ladouceur, 1989; Gibbs Van Brunschot, 2009; Grant & Kim, 2002; Grant, Kushner & Kim, 2002; Gupta & Derevensky, 1998; Hardoon, Gupta & Derevensky, 2004; Hodgins et al., 2010; Johansson et al., 2009a, 2009b; Joukhador, Blaszczynski & Maccallum, 2004; Joukhador, Maccallum & Blaszczynski, 2003; Kausch, Rugle & Rowland, 2006; Kim et al., 2006; Ladouceur & Walker, 1996; Langhinrichsen-Rohling et al., 2004; Lawrence et al., 2009; Ledgerwood & Petry, 2006; Lesieur & Custer, 1984; Lesieur et al., 1991; Lester, 1994; Li, 2007; Loo, Raylu & Oei, 2008; Lorains, Cowlishaw & Thomas, 2011; MacLaren, Fugelsang et al., 2011; McCormick et al., 1984; Meyer & Fabian, 1992; Miller & Currie, 2008; Mood Disorders Society of Canada, 2004; Morasco & Petry, 2006; Myrseth et al., 2009; National Gambling Impact Study Commission, 1999; Nixon & Solowoniuk, 2009; Nixon, Solowoniuk & McGowan, 2006; Nower & Blaszczynski, 2006; Ohtsuka & Chan, 2010; Parke, Griffiths & Irwing, 2004; Petry, 2005, 2007; Petry & Steinberg, 2005; Petry, Stinson & Grant, 2005; Powell et al., 1999; Productivity Commission, 1999, 2010; Quigley et al., 2014; Raylu & Oei, 2002, 2004; Rush et al., 2008; Schull, 2002; Skitch & Hodgins, 2004; Slutske et al., 2000, 2001, 2009; Specker et al., 1996; St-Pierre et al., 2014; Steel & Blaszczynski, 1998; Sundqvist & Wennberg, 2014; Toneatto et al., 1997; Toneatto & Nguyen, 2007; Turner et al., 2008; Turner, Zangeneh & Littman-Sharp, 2006; Volberg, Reitzes & Boles, 1997; Welte et al., 2007; Westphal & Johnson, 2007; Wohl & Enzle, 2002; Wood & Griffiths, 2007; Wood, Williams & Parke, 2012; Zimmerman, Chelminksi & Young, 2006.

The above cross-sectional research has been quite useful in identifying a large range of variables having potential etiological relevance to problem gambling. However, these studies have 2 main limitations. First, most of them assessed only a small subset of variables rather than a simultaneous assessment of *all* potential correlates that would identify the relative importance of each variable. The second limitation is that cross-sectional research sheds no light on the temporal sequence of events. Consequently, for many of these variables it is uncertain whether the variable contributed to the development of problem gambling, appeared as a result of problem gambling, or developed coincidentally with problem gambling.

Longitudinal Studies of Gambling and Problem Gambling

Longitudinal research is the best way of disentangling the chronology and causal relationships between variables. This methodology has been applied successfully many times in the fields of health, mental health, and addiction. To date, however, comprehensive and large scale longitudinal studies of gambling are comparatively uncommon. To contextualize the present research, all known longitudinal studies of gambling and/or problem gambling are described in the present section (presented alphabetically). At the end of this section a summary of their findings is provided.

Abbott, Volberg & Williams (1999), and Abbott, Williams & Volberg (2004) conducted face-to-face interviews in 1998 with 143 adults who had participated in the 1991 New Zealand gambling telephone-based prevalence survey of 4,053 adults (Abbott & Volberg, 1991). (These 143 people came from the 217 people who received face-to-face interviews 2-3 months after being assessed over the phone in the population survey). These 217 people were chosen for follow-up because of frequent gambling involvement and/or because they were designated as either lifetime problem or pathological gamblers on the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987). Most respondents had reduced their overall level of gambling participation from 1991 to 1998. In addition, only a minority of individuals who were problem or pathological gamblers in 1991 were found to be problem (9%) or pathological gamblers (23%) in 1998.[2] The factors in 1991 that best predicted problem and/or pathological gambling in 1998 were male gender, involvement in race track betting, being a problem or pathological gambler, and the presence of alcohol problems.

Abbott (2012) reported on the changes from 2006 to 2009 in the parents of an initial cohort of 1,398 children born in South Auckland, New Zealand in 2000, where at least one of the parents was an indigenous Pacific Islander ([Pacific Islands Families Study](#)). Among the 591 fathers, taking up or giving up alcohol consumption was associated with starting or quitting gambling, and becoming depressed was associated with starting to gamble. Among the 957 mothers, increased risk for gambling was associated with prior gambling, a worsening financial situation, mild 'deprivation', and smoking. Change in marital status from partnered to separated was associated with lower risk for gambling.

Barnes et al. (1999, 2002, 2005) conducted 2 studies of adolescents and family members living in a metropolitan area of western New York, USA, over a 7 year period starting in 1989. In Study 1 researchers conducted 6 annual assessments of 699 adolescents aged 13 – 16 at intake and at least one family member (71% retention). In Study 2, 3 assessments were conducted at 18 month interviews from 1992-96 with 625 youth ages 16-19 at intake (92% retention). Alcohol

---

[2] However, this instability was also observed immediately after the initial telephone assessment, as only 18 of 65 SOGS (lifetime) pathological gamblers and 10 of 26 SOGS (past 6 month) pathological gamblers were confirmed as such in the clinical interview *2-3 months* later (Abbott & Volberg, 1992). In addition, 14 individuals who were not designated as pathological gamblers by the SOGS were assessed as pathological gamblers in the clinical interviews (Abbott & Volberg, 1992).

use questions were asked in all waves in both studies. Gambling behaviour questions (frequency of past year gambling on 11 different forms) were asked in the last two assessments of both studies, when the participants were 18-22 years old. Findings indicated that impulsivity, moral disengagement (males), and adolescent/peer delinquency predicted subsequent gambling and alcohol consumption, even when controlling for demographic factors. Alcohol misuse by males was also found to predict increased gambling over time, even when controlling for other factors. Low parental monitoring was found to be a significant predictor of alcohol and substance misuse, but not gambling behaviour when taking into account socio-demographic and individual factors. Higher levels of parental monitoring and lower levels of alcohol misuse predicted decreased male gambling.

Cunningham-Williams et al. (1998) and Cottler & Cunningham-Williams (1998) based their research on the St. Louis, Missouri sample from the U.S. national epidemiological catchment area (ECA) study of mental disorders (1980-85; n = 20,861; 4 sites: Connecticut, Maryland, Missouri, and North Carolina; St. Louis sample n = 3004). In the Cunningham-Williams et al. analysis (n = 2954; 40% male; data collected in 1981), higher rates of psychiatric disorders among problem gamblers were found, with phobic and depressive episodes appearing prior to gambling problems. Antisocial disorder, alcohol dependence, and tobacco dependence appeared to be particular risk factors. Cottler and Cunningham-Williams conducted 11 year follow-up interviews with 162 drug users from the St. Louis sample. Results revealed an association between childhood conduct problems and becoming a problem gambler, but no other psychiatric conditions were found to be predictive. An association between developing gambling problems and developing alcohol problems was also obtained.

Cyders & Smith (2008) sampled 418 first year students aged 18-32 (75% female) attending college in the mid-western USA and followed the cohort 3 times over 1 year (79% retention). The self-administered assessments repeatedly measured 5 personality traits (negative urgency, or "… the tendency to act rashly when upset"; positive urgency, or "…the disposition to engage in rash action when in an unusually positive mood"; lack of planning; lack of perseverance; and sensation seeking), as well as gambling behaviour reported as part of on an 83-item scale assessing frequency of participation in a range of risky behaviours. Three traits were included in the final structural equation model (negative urgency and lack of perseverance having been removed after findings indicated a lack of association with gambling behaviour or risky behaviour, either longitudinally or cross-sectionally). Of the three traits in the model, only positive urgency (associated with impulsivity), was found to predict increased gambling behaviour.

DeFuentes-Merillas et al. (2004) examined the 2 year stability of pathological scratchcard gambling among Dutch adult scratchcard buyers. Only scratchcard buyers (n = 201) who had already experienced scratchcard-related problems were followed. The stability of pathological gambling ranged from 11.1% to 42.9%, depending on whether or not those lost to follow-up were presumed to be cases of pathological gambling.

Delfabbro, Winefield & Anderson (2009) assessed the gambling behaviour of 578 South Australian youth aged 15 at baseline, and tracked them annually for 4 years (2001-2005). The cohort was a sub-sample of a larger, ongoing survey of youth in South Australia (n = 2500; annual retention rate of 83.3%), selected for analysis based on gambling participation data available over all 4 measurement periods. In addition to overall tracking of gambling patterns over time, the study examined whether gambling at a younger age was associated with subsequent gambling as a young adult. Findings indicated that gambling at ages 16-17 (but not age 15) was predictive of gambling at ages 18-19. This effect was seen for lottery gambling, games of skill, and electronic machine gambling. Early to mid-adolescent gambling was not found to be associated with adult gambling, and gambling involvement was found to vary considerably over time.

Goudriaan, Slutske, Krull & Sher (2009) followed 3720 undergraduate students living in Missouri, USA in research conducted from 2002-2006. This 2-year longitudinal study of college health examined self-reported changes in gambling behaviour, gender, fraternity/sorority membership, alcohol and drug use, indicators of behavioural under-control (novelty seeking; conduct disorder) and psychological distress. Average age at intake was 18.0 years, and a response rate of 60-67% was seen each year (82% participated in at least 2 of the 4 assessments). Surveys occurred twice per year, with the gambling section administered only once per year via online administration (12 questions: frequency of gambling on 10 different forms; days gambling in past 12 months; self-identified gambling problems). The researchers identified 4 gambling groups: low-gambling, card-gambling, casino-gambling, and extensive gambling. Compared to low gamblers, the other gambling groups all had higher scores on alcohol and drug use, as well as novelty seeking and self-identified gambling problems, with the extensive gambling group showing the highest scores on these indicators. Researchers concluded that gambling frequency as well as readily available, informal gambling appeared to be risk factors for problem gambling, which was also correlated with heavy alcohol and drug use, psychological distress, conduct disorder, and novelty seeking.

Hodgins & el-Guebaly (2004) recruited 101 pathological gamblers from the community who had recently quit gambling. Of the 101 participants, 72 were followed at 3 months, 71 at 6 months, and 80 at 12 months. Relapse rates were high, with only 8% being entirely free of gambling during the 12-month follow-up. Relapses were highly variable but occurred most frequently in the evening, when the person was alone and thinking about finances. Moods prior to the gambling were as likely to be positive as negative. The most frequently reported attributions, particularly for major relapses, were cognitions about winning and feeling the need to make money.

Hofmeyr et al. (2011), Ross & Hofmeyr (2012), and Dellis et al. (2013) conducted 6 face-to-face assessments over a 15 month period in 2010 – 2011 of an initial sample of 298 adults. This sample was drawn primarily from people surveyed in the 2008 national urban prevalence study of gambling in South Africa. Sampling for the cohort was stratified to obtain a roughly equivalent number of people in the Canadian Problem Gambling Index (CPGI) non-problem and low risk category, moderate risk category, and problem gambling category. There was a 25.8%

response rate to the solicitation to be part of the cohort. Due to an insufficient number of problem gamblers, the sample was augmented by 47 people recruited via newspaper advertisements. In the end, at the first assessment there were 132 people in the non-problem/low risk category, 73 in the moderate risk category, and 93 in the problem gambling category (using a 3 month time frame for the CPGI). There was an 83.2% retention of the sample (n = 248) by assessment 6, with almost all attrition due to death, serious illness or people leaving the city. One finding of the study was that there was significant instability in gambling categorization from one assessment period to the next, with an average of only 61.5% of non-problem, 25.9% of low risk, 34.5% of moderate risk, and 44.2% of problem gamblers being in the same category at the next assessment. Another major finding was that changes in depression, anxiety, and impulsivity over time were significantly associated with coincident changes in problem gambling severity scores over time. [3]

Jacques, Ladouceur & Ferland (2000) and Jacques & Ladouceur (2006) examined the relationship between gambling behaviour and proximity to gambling venues as a function of whether people lived in an area where a casino was planned to open or in an area where no casino was planned to open. Eleven months after the casino opening the group near the new casino showed a significant increase in casino gambling, maximum amount of money lost gambling in one day, and reports of knowing a person who developed a gambling problem in the past year (Jacques et al., 2000). However, these differences were not maintained at 2 and 4 year follow-up intervals (Jacques & Ladouceur, 2006).

Kairouz, Nadeau & Luce (2012) conducted 3 telephone assessments in 2009, 2010, and 2011 of an initial sample of 179 people selected from the 2009 gambling population prevalence study in Quebec, Canada. The initial prevalence study achieved a 52.5% response rate. A small percentage of people overselected for higher CPGI scores were invited to participate in the longitudinal study, and there was a 29.2% response rate to this solicitation (including 27 individuals with a CPGI score of 8 or higher, and 43 people with a CPGI score of 3 – 7). A total of 137 people completed the third assessment for an overall retention rate of 76.5%. These investigators found that at the third assessment, 84.4% of non-problem gamblers were still in the same category, compared to 63.0% of low risk gamblers, 41.2% of moderate risk gamblers, and 58.8% of problem gamblers. The occurrence of certain life events was associated with a coincident increase in CPGI scores over time, the occurrence of other life events was associated with a coincident decrease of CPGI scores, and that the effect of specific life events was different for different types of gamblers.

In a series of studies by LaBrie, Kaplan, LaPlante, Nelson & Shaffer (2008); LaBrie, LaPlante, Nelson, Schumann & Shaffer (2007); LaBrie & Shaffer (2011); LaPlante , Kleschinsky, LaBrie, Nelson & Shaffer (2009); LaPlante, Nelson, LaBrie & Shaffer (2012); LaPlante, Schumann, LaBrie & Shaffer (2008); Nelson, LaPlante, Peller, Schumann, LaBrie & Shaffer (2008); and Xuan &

---

[3] Lottery choice and time preference experiments were also conducted with each participant. However, these experiments were compromised by fieldworker fraud (rigging lotteries to increase payouts to participants, who then shared their winnings with the fieldworkers). The impact on the validity of the questionnaire data in the longitudinal aspect of the study is unknown.

Shaffer (2009), the documented longitudinal gambling behaviour of 40,000+ patrons of the online gambling site www.bwin.com was examined. These researchers found that the betting and gambling behaviour among most bwin customers was both moderate and adaptive (i.e., level of betting subsided over time), with the exception of the top 1-5% of most heavily involved bettors (LaBrie, LaPlante, Nelson, Schumann & Shaffer, 2007; LaBrie, Kaplan, LaPlante, Nelson & Shaffer, 2008; LaPlante et al., 2009).

Lee, Storr, Ialongo & Martins (2011) studied 673 first grade students from Baltimore, Maryland, USA, recruited as part of a prevention and intervention longitudinal study that began in 1993 and where participants were assessed annually until age 19-20. Problem gambling was assessed in 618 adolescents who participated in at least one of the 2004, 2006, and 2007 follow-ups, using the South Oaks Gambling Screen-Revised for Adolescents (Winters, Stinchfield & Fulkerson, 1993). Data on impulsivity in early adolescence (teacher-rated), and symptoms of depression (self-reported) were gathered cross-sectionally when the cohort was in Grade 6. Gambling categorizations were identified as 45.2% nongamblers, 43.2% social gamblers, and 11.6% problem gamblers. The researchers found that among boys, both impulsivity and early adolescent depressive symptoms were associated with problem gambling in late adolescence, with depressive symptoms having the stronger association. The presence of depressive symptoms was also negatively associated with impulsivity.

Martin, Lichtenberg & Templin (2011) examined 247 urban elders from Detroit, Michigan, age 60 and older, the majority of whom were African-American and female. They were surveyed in 2002 and again in 2004 with the primary focus of the study being the attitudes, motivations, and gambling patterns of these individuals. Overall gambling behaviour decreased over a 2 year period. At Time 1 25.5% were gambling monthly or more, which decreased to 16.9% at Time 2. At Time 1, 32.9% reported not having gambled during the preceding year which increased to 48.6% at Time 2. Within individuals, 84% of people who reported never gambling at Time 1 also reported never gambling at Time 2; 50% of people who reported gambling rarely at Time 1 also reported gambling rarely at Time 2; and 45% of people who reported gambling monthly or more at Time 1 also reported this level of involvement at Time 2.

McComb (2010) undertook secondary analysis of data gathered in the "Natural History of Nicotine Dependence in Teens" study conducted in Quebec, Canada, with a cohort of youth aged 12-13 years (n = 1293). Baseline assessment occurred in 1999, and the cohort was followed every 3-4 months for 5 years. The investigator examined survey data gathered at ages 16-17, and data from 873 participants (67.5% of the original cohort) who completed a follow-up questionnaire at age 21-22. Male gender, impulsiveness, alcohol and cigarette use, and school problems in adolescence were found to be associated with increased gambling in adulthood, with 'family worries' (financial; relationships with father and siblings; separation or divorce of parents) moderating this relationship.

Pagani, Derevensky & Japel (2009, 2010) conducted telephone interviews of a subsample of the 1999 kindergarten cohort of the "Montreal Longitudinal Preschool Study" in Canada (original n = 467). Intact families (n = 377) were contacted in 2005 for the purpose of examining parent-child

gambling involvement, and a final subsample of 163 children and their parents was recruited. Measures included child gambling behaviour, early emotional distress, gender, maternal education, family dysfunction, parental gambling, and early impulsivity. Study findings indicated that teacher-rated emotional distress in kindergarten (inattentiveness, distractibility, and restlessness) was found to predict gambling behaviour in Grade 6, with this predictive relationship completely explained by impulsivity and its comorbidity with emotional distress. (A one unit increase in kindergarten impulsivity corresponded to a 25% increase in later self-reported child involvement in gambling). None of the covariates (including parental gambling) were identified as potential confounds.

Parhami, Mojtabai, Rosenthal, Afifi & Fong (2014) examined longitudinal data from waves 1 and 2 of the U.S. National Epidemiological Survey on Alcohol and Related Conditions (NESARC) (n = 34,653). DSM-V criteria for disordered gambling were used to group respondents into 4 categories: gambling disorder; sub-threshold gambling disorder; recreational gambler; and non-gamblers. In wave 2 (3 years after wave 1), gambling category was associated with progressively increased risk of having a mood, anxiety, and/or substance use disorder: odds ratio of 1.2 for recreational gamblers; 1.8 for sub-threshold disordered gamblers; and 2.5 for disordered gamblers.

Reith & Dobbie (2011; 2013) interviewed 50 recreational and problem gamblers aged 18-55+ (66% male) from the Glasgow, Scotland area on 4 occasions from 2006 to 2011. The cohort comprised 3 groups at intake: problem gamblers in treatment (n = 12), with problem gambling defined as scoring 3 or more on the NODS (Gerstein et al., 1999); problem gamblers not receiving any treatment services (n = 21), and recreational gamblers gambling at least once per week (n = 17). Three subsequent face-to-face interviews were conducted. A total of 45 people took part in the second interview, 38 in the third and 29 in the final one. The study found that change, rather than stability, was the norm in gambling behaviour (only 2 individuals maintained consistently problematic gambling over the 5 years). Four different trajectories were identified: progression (n = 8), reduction (n = 3), consistency (n = 15) and non-linearity (n = 18). A key recurring explanation for both increased, as well as curtailed, gambling behaviour was an experience of a significant life event such as bereavement, caring for sick relatives/friends, losing or changing job, birth of child, starting or ending a relationship. Similarly, social networks and finances were also factors involved in both reduced and increased gambling. Electronic gambling machines, alcohol use, and insecure employment were important moderators of progression and nonlinearity, while social support and stable employment were recurring themes in narratives of recovery and consistency.

Scherrer et al. (2007) and Xian et al. (2007) examined the impact of psychiatric disorders and genetic vulnerability to problem (PG) and pathological gambling (PPG). Diagnoses of DSM-III-R lifetime PG and PPG were derived in 1992 and past-year PG and PPG in 2002 from 1,675 individual twins from the Vietnam Era Twin Registry. Logistic regression was used to predict past-year PG and PPG as a function of socio-demographics and life-time co-occurring psychiatric disorders including gambling problems measured in 1992. High school or greater educational attainment was associated with less likelihood of future PG and PPG. Nicotine dependence,

drug dependence, post-traumatic stress, depression/dysthymia, and conduct disorder/antisocial personality were significantly associated with future PG and PPG. Alcohol dependence and generalized anxiety/panic was not significantly associated with future PG and PPG. Having PPG symptoms in 1992 was the strongest predictor of PG and PPG 10 years later.

Scholes-Balog, Hemphill, Dowling & Toumbourou (2014) analyzed data from the Australian (Victoria) arm of the International Youth Development Study. Two time points were examined, the first when students were in grade 9 (age 14 – 16) and the second when they were between 18 and 25. A total of 2,328 individuals were assessed at both time points (out of 2,884 original recruits; 80.7% retention). Individuals were designated as problem gamblers if they reported that in the past 12 months they had tried to keep their family or friends from knowing how much they gamble and/or that there had been a time when they thought they might have had a gambling problem. At a univariate level, variables significantly predicting subsequent problem gamblers were: male gender, family conflict, family history of antisocial behaviour, academic failure, low school commitment, rebelliousness, interaction with antisocial peers, friends' use of drugs, rewards for antisocial involvement and antisocial behaviour, cigarette use, and alcohol use. Statistically significant protective factors were belief in a moral order and receiving rewards for prosocial involvement. In the multivariate logistic regression female gender was associated with reduced risk of problem gambling, while family rewards for prosocial involvement moderated the risk relationship between adolescent alcohol use and young adult problem gambling.

Shaffer & Hall (2002) conducted a prospective study of 6,067 U.S. casino employees over a 3 year period (3 assessments, 11% retention), using self-administered questionnaires to examine patterns of alcohol use (the CAGE questionnaire) and gambling problems (the SOGS). The investigators found that 78% of people maintained their same gambling classification (Level 1, 2, or 3) over the 3 year period. Major depression and dissatisfaction with personal life circumstances were related to *decreased* rates of gambling problems.

Shenasse, Paradis, Dolan, Wilhelm & Buka (2012) prospectively examined the relationship between self-reported lifetime problem gambling (using the SOGS) in adulthood, and psychologist-rated impulsivity and shyness/depression at age 7 among 958 adult participants (mean age 39.2) whose mothers had joined a study of prenatal and perinatal factors relating to childhood mental, neurological, and physical abilities. The sample originated from a study of expectant mothers recruited in Massachusetts and Rhode Island, USA from 1959 to 1966 (n = 17, 741), with 15,721 children assessed by psychologists several times between birth and age 7. The testing at age 7 comprised cognitive, sensory, and motor function evaluation. Thirty years later, in 1999, a separate tobacco use study tracked and studied a subsample of the children (n = 3121). Using this subsample, Shenasse et al. selected a further subset for their own adult follow-up. Assessment consisted of a mailed package of self-report questionnaires to 1674 eligible participants, with 958 assessment packages returned. Data analyzed by Shenasse et al. consisted of 30 derived variables based on psychologist ratings at age 7, further reduced to three subscales via principal components analysis: impulsivity; shy/depressed; outgoing (removed from subsequent analyses because the authors determined that the component

measures did not capture inherently problematic behaviour); and lifetime gambling behaviour (non-problem gamblers = 900; problem gambler (SOGS score ≥ 3) = 58). Multivariate logistic regression modelling found that participants who had been identified as impulsive at age 7 were 3.1 times as likely to report lifetime problems with gambling as adults, while psychologist-rated shy/depressed behaviours were not found to be significantly associated with adult problem gambling.

Slutske, Jackson & Sher (2003) examined the problem gambling status of 468 first year students from the University of Missouri who were 18-19 years old and were part of a longitudinal study of the development of alcohol use patterns and associated problems. Problem gambling in this study was defined as endorsement of 1 or more DSM-IV symptoms of pathological gambling. Participants were followed on 3 subsequent occasions over 11 years with a retention rate of 84% at Year 11. The overall prevalence of problem gambling was fairly stable at the aggregate level (2%–3%, 1%–2%, and 3%–5%), but very unstable at the individual level.

Slutske, Caspi, Moffitt & Poulton (2005) examined 3 years of data from 939 New Zealanders that were part of a birth cohort study of health and behaviour (Dunedin Multidisciplinary Health and Development Survey). The study began in 1972 (n = 1,140), with assessment of personality traits at ages 18-19, and disordered gambling at age 21. Investigators found that problem gambling at age 21 was associated with higher levels of negative emotionality and lower levels of 'constraint' at age 18, with the former trait being the stronger predictor of the two. Personality traits of aggression and alienation were found to be more predictive of disordered gambling than impulsivity and sensation-seeking. Using the same birth cohort data, Slutske, Moffitt et al. (2012) extracted data from the cognitive and motor skills assessment at age 3 (n = 1,037; 91% retention; 48% female), and the disordered gambling assessments at age 21 (n = 939) and age 32 (n = 959). Results indicated that children considered to have under-controlled temperaments at age 3 were more than twice as likely to have gambling problems at ages 21 and 32, even when controlling for childhood intelligence and family socioeconomic factors.

Stephenson (2012) recruited 679 18-20 year olds in Manitoba, Canada through random telephone calls, online recruitment, referrals and at Winnipeg casinos, for the Manitoba Longitudinal Study of Young Adults. One percent of the baseline sample consisted of individuals who had a CPGI score of 8+, and an additional 10% had scores between 3 and 7. All cohort participants received a comprehensive assessment of variables etiologically related to problem gambling. Part of the assessment was conducted over the phone and part either via mail-in or online. The study was conducted in 2008, 2009, 2010, and 2011 using a 7-8 month assessment window. Retention at the fourth and last assessment was 76.1% (n = 517). Data has not yet been analyzed.

Vander Bilt et al. (2004) followed 1,016 elderly Americans (71 – 97) from a rural area of Pennsylvania over a 4 year period (2 assessments, 67% retention). They found that younger age, male gender, having greater social support, and alcohol use were factors predictive of future gambling.

Vitaro et al. (1996, 1997, 1999, 2001, 2004) and Wanner et al. (2006, 2009) followed 1,161 kindergarten boys in Quebec, Canada (average age of 6) for a 12 year period starting in 1984 (annual assessments, 78% retention; socio-family risk data collected at age 10; impulsivity data collected at age 14; gambling and depression data collected at ages 17 and 23). They identified 3 different trajectories: individuals who had a low probability of gambling throughout; individuals who were chronic high gamblers; and individuals who did not gamble before age 13 but began gambling heavily after that period. In general, findings indicated that early onset of gambling, impulsivity, low inhibition, and risk taking were predictive of problem gambling later in adolescence. In a more recent analysis of the same data, Dussault, Brendgen, Vitaro, Wanner & Tremblay (2011) developed a model linking impulsivity to future problem gambling and depressive systems. They found that impulsivity at age 14 (n = 1004), positively predicted problems with depression and gambling at age 17; that gambling problems at age 17 predicted escalating depressive symptoms from age 17 to 23; and that depression at age 17 predicted escalating gambling problems between ages 17 and 23. The authors posit that problem escalation after late adolescence is best explained by direct influences between depressive symptoms and gambling, while common antecedent factors may best explain the initial emergence of the link between depression and problem gambling.

Wiebe, Single & Falkowski-Ham (2003) completed a 1 year follow-up of 602 adults (18+) in Ontario, Canada who represented a subsample of people who had participated in a general population prevalence study of gambling and problem gambling 1 year previously (43% retention). Results showed considerable instability in certain Canadian Problem Gambling Index classifications, with 85% of Non-problem Gamblers, 41% of Low Risk gamblers, 36% of Moderate Problem Gamblers, and 80% of Severe Problem Gamblers classified in the same gambling severity category 1 year later. Emotional distress in the previous year was predictive of higher scores on problem gambling in the subsequent year.

Winters et al. (1995, 2002, 2005) followed a U.S. (primarily Minnesota) cohort of 702 youth (15 – 18) for 8 years (3 assessments, 43% retention). A total of 60% were found to be non-problem gamblers at all 3 assessment periods. A total of 21% of non-problem gamblers became at-risk or problem gamblers; 13% of at-risk and problem gamblers became non-problem gamblers; and only 4% were at-risk or problem gamblers at all 3 time periods. Several variables were predictive of subsequent at-risk or problem gambling: male gender, parental gambling history, poor school performance, substance abuse, delinquency, and early onset of gambling. In general, the results supported the contention that there is a core set of risk factors in adolescents that predict a wide range of subsequent problem behaviours.

Comprehensive and Dedicated Longitudinal Studies of Gambling

The above described longitudinal studies provide useful information about the stability of gambling and/or problem gambling and/or the identification of variables that predict the subsequent development of gambling and/or problem gambling. As such, they provide important etiological information beyond what could be obtained with correlational studies.

That being said, virtually all of these studies have one or more of the following deficits that limit our ability to develop a comprehensive etiological model of problem gambling:

- Assessment of only a small subset of etiologically relevant variables.
- A very circumscribed demographic (e.g., youth, elderly, casino employees).
- A very small sample size and/or a very small number of people who became problem gamblers during the course of the study.
- A very short time span and/or a small number of assessment periods.
- A study of either gambling or problem gambling, but not both.
- Poor retention rates with differentially higher attrition for certain demographic groups (e.g., males, younger people) and people who are heavy gamblers and/or problem gamblers.

Partly in recognition of the limitations of these smaller and/or more circumscribed studies, 4 comprehensive large scale dedicated longitudinal studies of gambling have been undertaken in 3 different jurisdictions:

The Swedish Longitudinal Study or SWELOGS (Romild, 2012; Romild, Volberg & Abbott, 2014) is funded by the Swedish National Institute of Public Health. The study began in 2008/2009 with a brief 15 minute telephone prevalence study of gambling and problem gambling in a random sample of 8,165 Swedes aged 16-84 stratified by gender, age, and risk for problem gambling (response rate of 54.4%).[4] A total of 6,021 of these individuals were reassessed again in 2009/10 and 4,188 in 2012 (retention rate of 51.3%). The final assessment occurred in late 2014. In addition, a more comprehensive 60 minute telephone interview of 1,750 of these individuals was undertaken in 2011 (unknown response rate). These individuals were re-interviewed in 2013 and again in 2015. A case control design is being used, whereby all the CPGI moderate risk and severe problem gamblers were selected for interviews, as were a sample of CPGI low risk and non-problem gamblers. Each of these individuals has 3 matched controls selected from the general sample that match the person on basic demographics. A final feature of SWELOGS is the follow-up of 578 individuals from the 1997/1998 Swedish gambling prevalence study (289 problem gamblers and a matched set of controls). To date, the following variables have been found to be statistically significant predictors of subsequent CPGI 3+ scores (listed in order of importance): started to gamble at work or at school, being an immigrant, 'computer gambling' (i.e., online gambling or EGM play), past year gambling, risky alcohol consumption, poorer mental health, death of someone close, increased arguments with someone close, and poorer general health. The stability of gambling category by the third assessment was as follows: Non-Problem Gambling (~52%), Non-Gambling (~42%), Low Risk Gambling (~41%), Moderate Risk Gambling (~38%), and Problem Gambling (~18%).

The Victorian Gambling Study (VGS) (Billi, Stone, Marden & Yeung, 2014) was funded by the Victoria Department of Justice in Australia. The study began in July 2008 with a telephone

---

[4] The telephone survey data was supplemented by information taken from the Swedish population register which contains extensive information on income, taxes, education, occupation, immigration, etc.

prevalence survey of gambling behaviour among 15,000 adults in the state of Victoria, with oversampling of local government areas having higher EGM expenditure (response rate of 43.5%). There were 3 subsequent waves roughly 12 months apart in 2009/2012, 2010/2011, and 2011/2012. A 5 month assessment window was used. A total of 5,003 people took part in Wave 2, 5,620 in Wave 3, and 3,701 in Wave 4 (24.7% retention). The assessment itself consisted of a 15 – 25 minute telephone interview focusing on gambling practices, lifetime gambling history, important life events in the past 12 months, substance use and abuse, health and well-being, social capital, and demographic information (only a subset of these variables were administered in every wave). Forty-four people identified as CPGI 8+ problem gamblers in at least one wave participated in focus groups so as to collect some qualitative information. Non-Problem gamblers were the most stable category over the course of the study, with 93% of baseline Non-Problem gamblers still being in this category in the fourth assessment. This compares to 27% of the CPGI (1-2) Low Risk group, 35% of the CPGI (3-7) Moderate Risk group, and 55% of the CGPI (8+) Problem Gambling group. The incidence rate between wave 1 and wave 2 was 0.36%, with roughly two-thirds of these new cases comprising people with a previous history of problem gambling. The variables most predictive of subsequent Moderate Risk and/or Problem Gambling were are as follows: lifetime history of problem gambling symptomatology (as measured by the lifetime NODS CLip2), subclinical problem gambling (with 3% of the baseline Low Risk and 14% of the Moderate Risk groups becoming Problem Gamblers by the fourth wave), psychological distress and/or self-reported anxiety, growing up in a one-parent family, the presence of any health condition, and smoking. The variables most predictive of moving from Non-Problem Gambling to a Low Risk or higher category were: non-English speaking, less education, alcohol dependence, previous problem gambling symptomatology, anxiety, and obesity. Lifetime history of problem gambling was the variable most predictive of people who persisted in a Moderate Risk or Problem Gambling category over waves.

The Leisure, Lifestyle, Lifecycle Project (LLLP) was funded by the Alberta Gambling Research Institute (el-Guebaly, Casey, Hodgins, Smith, Williams, Schopflocher & Wood, 2008; el-Guebaly, Casey, Currie, Hodgins, Schopflocher, Smith & Williams, 2015). A total of 1,808 Albertans were recruited in 2006, with representative sampling from the major regions of Alberta, Canada (5.4% response rate). Five age cohorts were established at baseline (13-15; 18-20; 23-25; 43-45; 63-65) with approximately equal numbers in each group. A subset of 524 individuals were from a 'high risk' sample of individuals presumed to be at elevated risk for developing gambling problems because of their greater expenditure and frequency of gambling (70th percentile for either expenditure or frequency). All participants received a comprehensive 2 to 3 hour assessment of all variables of etiological relevance to gambling and problem gambling. The LLLP had 4 assessment periods, with a 17 – 22 month interval between each assessment and a 9 – 10 month period of time in which people could complete their assessment. The final assessment period ended in 2011. A total of 1,030 adults completed the fourth assessment, for a retention rate of 76.2% and a total of 313 adolescents completed the fourth assessment, for a retention rate of 71.8%. Participants were re-recruited for a fifth assessment that began 18 months after the end of the fourth assessment and ended in January 2014. A total of 970 individuals completed the fifth assessment, representing a 54.3% retention from the first assessment and a 73.0% retention from the re-recruited assessment 4 group. The full methodology and results of

this study are reported in el-Guebaly et al. (2015). However, the major findings of this study are reported in the present report.

The final large scale longitudinal study is the present Quinte Longitudinal Study (QLS), funded by the Ontario Problem Gambling Research Centre.

Summary of Findings from Existing Longitudinal Research

Stability of Gambling and Problem Gambling

A total of 14 longitudinal studies have reported results concerning the stability of gambling and/or problem gambling over time. These studies have been quite consistent in their findings. A common theme throughout these studies is that gambling categorization tends to be fairly unstable over time, with this instability being evident both over short periods of time (e.g., 1 year) as well as over much longer periods of time. An important caveat to this general finding is that instability varies significantly as a function of gambling category, with instability tending to be highest for 'at risk' categories of gamblers (e.g., CPGI Low Risk and Moderate Risk), lowest for recreational or non-problem gamblers, and intermediate for problem gamblers and non-gamblers. In general, most recreational gamblers have been found to remain recreational gamblers over time. In contrast, less than half of problem gamblers tend to be problem gamblers in the next assessment period (typically 1 year later) and only a small minority of problem gamblers have been found to have unremitting problem gambling over multiple consecutive assessment periods.

Predictors of Future Gambling

A total of 7 longitudinal studies have reported results concerning variables that predict future gambling or level of gambling with 4 of these studies focusing on adolescents or youth. In addition to the previously mentioned limitations of these longitudinal studies and their findings, gambling behaviour has an imperfect relationship to problem gambling, thus there needs to be some caution in assuming these results are also directly relevant to prediction of problem gambling.

Impulsivity and alcohol use were reported as predictive of future gambling in 4 of these studies. Cigarette use, prior gambling, male gender, and financial problems were predictive in 2 studies. Several variables were identified in a single study: depression, younger age, school problems, adolescent and/or peer delinquency, lower parental monitoring, moral disengagement, and having greater social support (in an elderly sample).

Predictors of Future Problem Gambling

A total of 19 longitudinal studies have reported results concerning variables that have either covaried with or preceded future problem gambling. Alcohol problems were related to problem gambling in 7 studies with 1 additional study failing to find a relationship. Depression was related to problem gambling in 6 studies, with 1 additional study failing to find a relationship and 1 study finding depression to be related to decreased problem gambling. Impulsivity and tobacco use were found to be related to problem gambling in 5 studies. Less education and/or poor school performance, antisociality and/or conduct disorder were related to problem gambling in 4 studies. Significant life events were found to be related to problem gambling in 3 studies. Another 2 studies found that stress and/or emotional distress were related to problem gambling and a third study found that Post-Traumatic Stress was related. Prior pathological gambling, problem gambling, and/or subclinical problem gambling were identified as significant predictors of future problem gambling in 3 studies. Drug use and/or dependence, need for money and/or employment concerns, male gender, and poorer health were implicated in 3 studies each. Prior level of gambling frequency, electronic gambling machines, early onset of gambling, and being an immigrant were implicated in 2 studies each. Two studies found that anxiety was related to problem gambling with another study finding that phobias were related. One study found that panic disorder was not predictive of problem gambling. Several variables were identified as related to problem gambling in a single study: Internet gambling, race track gambling, one parent families, a family history of antisocial behaviour, parental gambling history, family conflict, antisocial and/or substance using social networks, social networking (more generally), aggression, novelty seeking, rebelliousness, risk-taking propensity, alienation, obesity, and thoughts about winning (amongst previously recovered pathological gamblers).

QLS Research Questions

As mentioned, the QLS is one of the 4 existing large scale longitudinal studies of gambling and problem gambling. The essential purpose of the QLS was to build upon and extend the findings of the existing longitudinal research.

The 4 primary research questions in the QLS study were as follows:

1. What are the normal patterns of continuity and discontinuity in gambling and problem gambling over time?

2. What individual, social, and structural variables mediate the development of responsible gambling and problem gambling?

3. What etiological model of gambling and problem gambling emerges from these findings?

4. What are the implications for the prevention of problem gambling that emerge from these findings?

METHOD

Sample

Geographic Area

The 4,121 people in the Quinte Longitudinal Study were recruited from the Quinte Region of southeastern Ontario (see Figure 1). More specifically, people were eligible for the study if they resided within 70 kilometers of the city of Belleville (Figure 2), which is the largest community in this region (population of 48,821 in 2006). The main communities represented within the study sample were Belleville (29.2%), Trenton (12.2%), Brighton (4.0%), Napanee (3.9%), Cobourg (3.8%), Picton (3.4%), and Stirling (3.2%).

This particular area was chosen because one of the original goals of the study was to assess the social and economic impacts of a new gambling venue, the Quinte Exhibition and Raceway - II (QER-II), that was to be built in Belleville in the spring or summer of 2007. The existing horse race track at the Quinte Exhibition and Raceway (QER) in Belleville was to close and a new horse race track with slot machines (QER-II) would be built. Horse racing did end at the existing QER after the 2006 season, but a new QER-II was never built. When the QER-II did not get built, the present study's exclusive focus became the natural course and etiology of gambling and problem gambling. (The QLS study was originally called the Quinte Exhibition and Raceway Impact (QERI) study).

A 70 kilometer radius around Belleville was chosen so as to exclude the major urban centres of Kingston (82 kilometer road distance east from Belleville with a population of 152,358 in 2006) and Peterborough (111 kilometer road distance west from Belleville with a population of 75,405 in 2006), whose residents would be less likely to patronize the new QER-II because of slot machine availability proximate to their own communities (Thousand Island Charity Casino and Kawartha Downs respectively).

Figure 1. Quinte Region (green circle) in Ontario, Canada.

Figure 2. Geographic Range of the QLS Cohort (70 km from the city of Belleville) and Proximity to Gambling Opportunities.
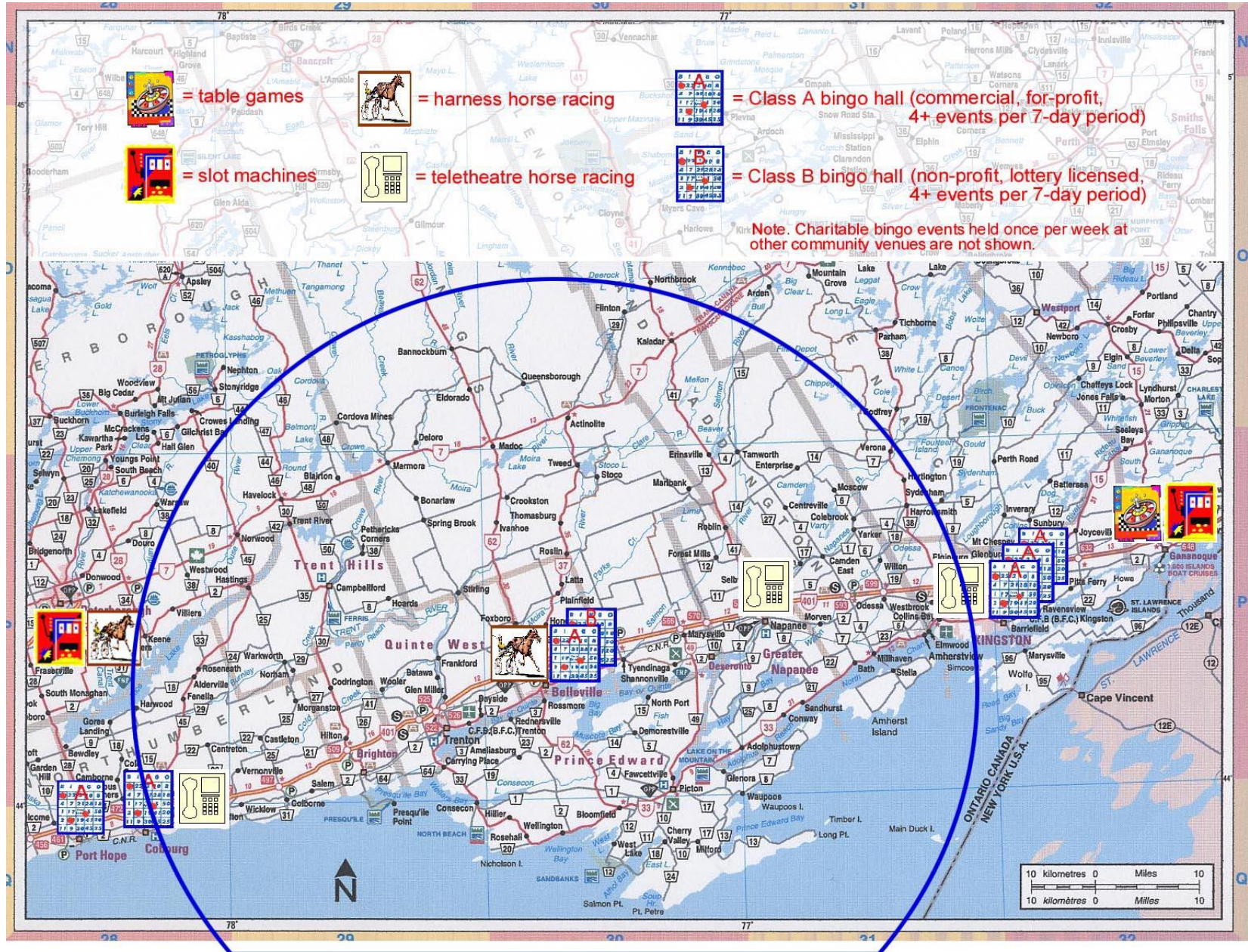
Testing of the Recruitment Surveys and Assessment Questionnaire occurred in October 2006. Recruitment of the full cohort began in November 2006 via random digit telephone dialing of telephone numbers from a pool of numbers with area codes and prefixes estimated to be within 70 kilometers of the city of Belleville. The phoning was conducted by the Toronto-based survey research company Consumer Contact. Two samples were recruited. The first was a 'General Population' sample and the second was an 'At Risk' sample.

General Population Recruitment (n = 3,065)

The recruitment script for the General Population sample (Appendix A) asked people to participate in a 4 minute survey about the potential impact of the new Quinte Exhibition & Raceway (QER-II), which was described as a new race track with 200 slot machines that was scheduled to open in Belleville in the near future.

To be eligible for the survey the person had a) to be age 18 or older [5], b) to be in an unfilled age x gender cell [6], and c) to confirm that they had a primary residence within 70 kilometers of Belleville. If eligible, the survey asked the person whether they believed the new facility would be beneficial or harmful, and what they believed the greatest potential benefit and harm to be. (These attitudinal questions were not used in the selection process for the cohort). If the person indicated they expected to be living in the Belleville area for at least another year, they were deemed eligible for the longitudinal study and asked the following:

"Would you be interested in earning $220 dollars to participate in a research study about the impacts of the new Quinte Exhibition and Raceway? We are recruiting people and interviewing them every 9 months[7] for 5 years (i.e., 6 assessments) to see what sort of impacts occur as a result of introducing slot machines into the new Quinte Raceway in Belleville. We are following both gamblers and nongamblers. This is a very important research project which will help shape government gambling policy. The questionnaires could either be done at our Belleville office or over the Internet, whichever is more convenient for you. Would you be interested?"

If the person agreed, they were sent an email with a link to the online questionnaire or booked into a time slot at the QLS Belleville office where they subsequently completed the questionnaire online on one of the QLS computers.

---

[5] We nonetheless recruited one 17 year old.

[6] There were 8 age x gender cells: males 18-24; females 18-24; males 25-44; females 24-44; males 45-64; females 45-64; males 65+; females 65+. The total sample size for the General Population sample was intended to be 3,000, with a minimum number of people in each cell representing of 50% of their true proportion for the Quinte region as established by the 2001 Canadian census (Belleville Census Agglomeration). (Note: the 2006 census data was not yet available at the time of recruitment).

[7] This was later changed to $180 for 5 assessments every 12 months because it was more logistically efficient to assess people on a 12 month rather than 9 month basis, and because the opening of the new QER-II was delayed.

At Risk Recruitment (n = 1,056)

The At Risk sample was recruited at the same time as the General Population sample. The purpose of the At Risk sample was to oversample people at risk of developing gambling problems to better ensure there were a sufficient number of people in the cohort who developed gambling-related problems during the course of the study. The recruitment script for the At Risk sample (Appendix A) was the same as the General Population recruitment script in that it asked people to participate in a short survey about the potential impact of the new Quinte Exhibition & Raceway. To be eligible for the survey the person had a) to be age 18 or older, and b) to confirm that they had a primary residence within 70 kilometers of Belleville. There were no age x gender quotas. If eligible, the person was asked whether they believed the new facility would be beneficial or harmful, and what they believed the greatest potential benefit and harm to be. Unlike the General Population recruitment survey, the At Risk recruitment survey included additional questions about past year participation in gambling and the person's intent to patronize the new QER-II.

For the person to be eligible to be invited to participate in the At Risk cohort, they had to indicate one or more of the following: spending $10 or more per month on lottery and instant win tickets in a typical month; spending $10 or more a month on bingo, casino table games, or games of skill against other people in a typical month; playing either slot machines or betting on horse racing in the past year; or an intention to gamble at the new QER-II when it eventually opened. If they met eligibility criteria they were invited in the same manner as the General Population cohort and sent an email with a link to the online questionnaire or booked into a time slot at the QLS Belleville office where they subsequently completed the questionnaire online on one of the QLS computers.

Representativeness

As seen below in Table 1, response to our invitation to participate in this 5 year longitudinal study was 21.3% using CASRO (1982) calculations.

Table 1. Response Rate for the Quinte Longitudinal Study.

Eligible numbers phoned	115,331
Number of people contacted and asked to do 4 minute survey	87,976
Refusals	53,422
Number of people agreeing to do 4 minute survey	34,453
Number of eligible people asked to be part of the QLS cohort	19,330
Number of people agreeing to be part of the QLS cohort	6,871 (35.5%)
Number of people actually completing QLS Assessment 1	4,121 (21.3%)

Table 2 documents the age x gender distributions of the General Population, At Risk, and Total Sample relative to the 2006 census data for the Belleville Census Agglomeration (CA), which geographically approximates the QLS study region. As can be seen, the QLS Total Sample has some underrepresentation of ages 18 – 24 and ages 65+, and some overrepresentation of females 25 - 64.

Table 2. Age x Gender Profile of the QLS Baseline Sample compared to the 2006 Belleville Census Agglomeration.

		General Population Sample	At Risk Sample	Total Sample	Total Sample %	Belleville CA %
18-24	Male	89	28	117	2.8%	5.9%
	Female	111	37	148	3.6%	5.7%
25 – 44	Male	568	158	726	17.6%	15.9%
	Female	693	248	941	22.8%	16.6%
45-64	Male	587	184	771	18.7%	16.9%
	Female	671	289	960	23.3%	17.8%
65+	Male	188	65	253	6.1%	9.0%
	Female	158	47	205	5.0%	12.2%
Total		3065	1056	4121	100.0%	100.0%

Having the sample representative of the Quinte region was an important goal when one of the purposes of the study was to gauge the socioeconomic impacts of the new QER-II on the region. However, as mentioned, when this venue was not built the exclusive purpose of the QLS was to determine the natural stability of gambling and problem gambling over time and to create a generalizable etiological model of problem gambling. To achieve this latter goal, it was no longer important that the QLS sample be representative of the Quinte region. Rather, what was important was *for the sample to contain a diverse range of gamblers,* as QLS is examining changes in gambling and problem gambling over time and the influence of different variables causally related to these changes (i.e., as long as the sample contained a diverse range of gamblers, the actual number in each subgroup was not that important). That being said, the relative importance of variables that are identified as etiologically important bears some relationship to their prevalence within the sample. Hence, it is preferable that the sample be not widely divergent from the population the etiological model is intended to apply to, which in the present case is *Canadian adult gamblers and problem gamblers*. As seen in Table 3, the demographic profile of the QLS Total Sample is fairly similar to Canadian adults (15+) as established by the 2006 Canadian Census, although the QLS sample tends to have fewer people age 18 - 24, seniors 65 and older, single people, immigrants, and visible minorities, and has a somewhat higher level of educational attainment.

Table 3. Comparative Profile of QLS Total Sample versus Canadian Adults in 2006.

		QLS Total Sample	Canadian Adults
Gender	% Female	54.7%	51.0%
Age	18-24	6.4%	11.9%
	25 – 44	40.5%	35.6%
	45- 64	42.0%	34.9%
	65+	11.1%	17.5%
Marital Status	Single	11.9%	31.6%
	Married or Common-Law	71.5%	52.8%
	Separated	5.0%	2.7%
	Divorced	7.7%	7.3%
	Widowed	3.9%	5.6%
Education	Did not Complete High School	11.2%	15.4%
	High School or Trades Certificate	25.0%	36.3%
	Post-Secondary Education	63.8%	48.3%
Household Income	Household Income $0 – $29,999	21.6%	25.7%
	$30,000 - $49,999	23.8%	20.9%
	$50,000 - $69,999	22.5%	16.7%
	$70,000 - $99,999	14.6%	12.6%
	$100,000 +	17.6%	24.1%
Employment	Employed (Part or Full Time)	62.4%	67.0%
Immigrant	Born outside of Canada	7.8%	19.8%
Race/Ethnicity	Aboriginal	4.4%	3.8%
	Visible Minority	8.5%	16.2%
	Caucasian	87.1%	80.0%

Table 4 documents the proportion of the baseline QLS Total Sample that was in each of the gambling categories of the Problem and Pathological Gambling Measure (PPGM) (Williams & Volberg, 2010; 2014), as compared to the 2010/2011 Ontario prevalence survey of gambling (Williams & Volberg, 2013). As anticipated (because of at-risk oversampling), the QLS Total Sample contained a somewhat higher proportion of At Risk, Problem, and Pathological Gamblers, and a lower percentage of Non-Gamblers. (Note: the comparable CPGI rates in the QLS Total Sample were 7.5% Non-Gamblers; 73.1% Non-Problem Gamblers (score of 0); 25.3% At Risk Gamblers (score 1 – 4); and 4.1% Problem Gamblers (score 5 and higher).[8]

---

[8] Using a score of 1 - 4 for At Risk Gamblers and 5+ for Problem Gamblers significantly improves the classification accuracy of the CPGI against clinical assessment (Currie, Hodgins & Casey, 2013; Williams & Volberg, 2010, 2014).

Table 4. PPGM Gambling Categorizations of the QLS Sample.

	QLS General Population Sample	QLS At Risk Sample	QLS Total Sample in 2006/2007	Ontario 2010/2011
Non-Gambler	10.1%	0.1%	7.5%	17.1%
Recreational Gambler	77.2%	70.6%	75.5%	74.4%
At Risk Gambler	10.5%	23.1%	13.7%	6.3%
Problem Gambler	1.4%	4.2%	2.1%	1.4%
Pathological Gambler	0.9%	2.0%	1.2%	0.8%

Creation of an etiological model of problem gambling in Canada not only required the sample to contain a diverse range of gamblers, but also having a geographic area that had reasonably similar gambling opportunities to the rest of Canada. Fortunately, the gambling landscape in the Quinte region was fairly similar to the rest of Canada due to the uniform and pervasive availability of most forms of gambling in all provinces (Statistics Canada, 2006, 2010).[9] More specifically:

- Charity raffles have always been legally available in Canada, and are commonly offered by community groups in all regions.
- On-site horse race betting has been legal since 1892, and the Quinte Exhibition and Raceway in Belleville had been in operation since 1821 (with standardbred/harness racing and betting being offered at the QER for many decades). Off-track horse race betting was legalized in Canada the 1990s and became widely available. There were 2 teletheatres offering off-track horse race betting in the Quinte region in 2006. (Note: betting on dog racing has never been legally available in Canada).
- Bingo has been commonly and pervasively available in Canada since the 1920s, and the city of Belleville had both commercial and community bingo halls in 2006.
- National and provincial lotteries were introduced in Canada in the mid-1970s, and tickets can be purchased at almost any convenience store, gas station, and other retail outlet throughout Canada.
- Instant lotteries were introduced throughout Canada during the 1980s and are sold at the same retail outlets as lottery tickets.
- Sports betting on 2 or more events was introduced throughout Canada during the 1980s (single event sports betting has never been legally permitted) and registering these bets can be made at the same retail outlets that sell lottery tickets.
- Permanent casinos offering table games were introduced in Canada beginning in the 1980s, with the primary period of introduction being the 1990s and 2000s. Two Atlantic provinces

---

[9] Provincial governments in Canada have jurisdiction over which forms of gambling are legally allowed with the exception of horse racing, which is under the purview of the federal government. All provincial governments opted to introduce the same forms of legal gambling in roughly the same time period.

have never introduced casinos with table games (Prince Edward Island, Newfoundland) and one Atlantic province only introduced them fairly recently (New Brunswick in 2010). The closest casino offering table games in the Quinte region was the Thousand Island Charity Casino in Gananoque which opened in 2002, just beyond the eastern edge of the study region and a 1 hour drive from Belleville.

- Electronic gambling machines (EGMs) were introduced in Canada during the 1990s in casinos, horse race tracks, and in lounges/bars. Ontario and British Columbia opted not to permit them in lounges/bars. However, both Ontario and British Columbia compensated by having more 'dedicated gambling venues'. Hence, for most people in Ontario and British Columbia the physical availability of EGMs tends not fundamentally lower compared to people in other provinces. As seen in Figure 2, the closest venues in the Quinte region with EGMs are Kawartha Downs in Fraserville (a horse race track which added slot machines in 1999) at the western boundary of the study region and a 75 minute drive from Belleville, and the Thousand Island Charity Casino in Gananoque.

- Online gambling was first introduced in Canada in 2004, but is unevenly distributed, with Ontario, Alberta, Manitoba, and Saskatchewan historically having fewer online gambling opportunities compared to the other provinces. That being said, because the Canadian federal and provincial governments do not require Internet Service Provision blocking of off-shore gambling websites, thousands of these online sites are readily available to any Canadian with an Internet connection (Williams, Wood & Parke, 2012a). Online horse race betting has been provided to all Canadians since 2004. The online purchase of lottery tickets was introduced in Prince Edward Island, Nova Scotia, New Brunswick, Newfoundland, and British Columbia in 2004, but not in Ontario until 2009 and Manitoba in 2013. Online sports lottery tickets could be purchased in 2004 in Prince Edward Island, Nova Scotia, New Brunswick, Newfoundland, and British Columbia, and in Quebec in 2010 and Manitoba in 2013. Online instant lotteries were provided in British Columbia in 2004 and in the Atlantic provinces in 2005. Online bingo was provided in the Atlantic provinces in 2007, British Columbia and Quebec in 2010, and Manitoba in 2013. Online poker was introduced in British Columbia in 2009, 2010 in Quebec, and 2013 in Manitoba. Online casinos were introduced in British Columbia and Quebec beginning in 2010, Manitoba in 2013 and Ontario in 2015.

Of final note, the legal age for gambling is 18 in the provinces of Alberta, Manitoba, and Quebec, which parallel's their legal age for alcohol consumption. In Ontario and other provinces the legal age for gambling is 18 for forms of gambling occurring in venues without alcohol (e.g., raffles, lottery tickets, instant win lottery tickets, sports lottery tickets, bingo), but 19 for casinos and other gambling venues that do serve alcohol.

Retention

A total of 93.9% of participants who completed Assessment 1 also completed Assessment 5 (the conventional way of calculating retention) and a total of 88.7% of participants completed all 5 assessments. Table 5 below shows retention rates by year, followed by Table 6 which shows the specific completion patterns. The retention rate in the QLS is exceptionally high for a large scale longitudinal study. Retention is one of the key determinants of the validity of any longitudinal study, as attrition is not usually random. Rather, males, young people, ethnic minorities, substance users, and individuals with mental health problems are known to have higher attrition (Claus, Kindelberger & Dugan, 2002; de Graaf et al., 2000; Eaton et al., 1992).

A logistic regression was undertaken to identify the characteristics of Individuals who completed Assessment 5 compared to individuals who did not. Twelve predictor variables were used: gender, age, immigrant status, ancestry, employment status, marital status, educational attainment, household income, rated physical health status, presence of a mental disorder, substance abuse or dependence, and problem gambling status. Variable entry was simultaneous. A test of the full model with all 12 predictors was significant, χ^2 (28, N = 4,121) = 92.7, p < .001, indicating that the 12 predictors, as a set, reliably distinguished between participants who completed Assessment 5 versus participants who did not. The variance accounted for was very small, however, with Nagelkerke R squared = 5.3%. Only 3 variables significantly predicted noncompletion of Assessment 5. In order of importance they were: marital status (not being married), poorer rating of physical health, and male gender.

Table 5. QLS Retention Rates.

	Full Completions	Partial Completions	Ineligible Participants	Eligible Participants	Retention Rate
Assessment 1	4121	0	0	4121	100.0%
Assessment 2	3934	3	29	4092	96.2%
Assessment 3	3896	4	43	4078	95.6%
Assessment 4	3822	5	58	4063	94.2%
Assessment 5	3795	3	77	4044	93.9%

Full Completions are people who completed the entire questionnaire.
Partial Completions are people who completed the questionnaire to the end of the gambling section (and were therefore included in the study).
Ineligible Participants are the cumulative number of people recruited at Assessment 1 who died or developed a permanent physical incapacitation (e.g., stroke) preventing them from completing the questionnaire and/or engaging in gambling.
Eligible Participants are the 4,121 people recruited at Assessment 1 minus the Ineligible Participants.
Retention Rate is the number of Full + Partial Completions divided by the number of Eligible Participants x 100.

Table 6. Detailed Assessment Completion Patterns in QLS.

	Completed Assessments	Percentage	Cumulative %
Assessment 1 only	106	2.6%	2.6%
Assessments 1 and 2 only	59	1.4%	4.0%
Assessments 1 and 3 only	6	0.1%	4.1%
Assessments 1 and 4 only	1	<0.1%	4.2%
Assessments 1 and 5 only	10	0.2%	4.4%
Assessments 1, 2 and 3 only	52	1.3%	5.7%
Assessments 1, 2 and 4 only	3	0.1%	5.8%
Assessments 1, 2 and 5 only	15	0.4%	6.1%
Assessments 1, 3 and 4 only	9	0.2%	6.3%
Assessments 1, 3 and 5 only	7	0.2%	6.5%
Assessments 1, 4 and 5 only	1	<0.1%	6.5%
Assessments 1, 2, 3 and 4 only	87	2.1%	8.6%
Assessments 1, 2, 3 and 5 only	39	0.9%	9.6%
Assessments 1, 2, 4 and 5 only	26	0.6%	10.2%
Assessments 1, 3, 4 and 5 only	44	1.1%	11.3%
All Assessments: 1, 2, 3, 4 and 5	**3656**	**88.7%**	**100.0%**
Completed 4 or more Assessments		93.4%	
Completed 3 or more Assessments		95.6%	
Completed Assessment 5	**3798**	**93.9%**	

Factors Responsible for High Retention

The principles responsible for the high retention in QLS are of scientific value in and of themselves, and are briefly described below as well more comprehensively in the *QLS Retention Manual* (McLaughlin et al., 2014)[10]:

1. *Conducting the assessment at the exact same time of year, each year.* Although the annual assessment periods generally ran from November 1 to March 31, the large majority of participants were notified about and completed their assessment between November and January. This facilitated retention because participants learned to expect contact and assessment completion in this circumscribed period.
2. *Providing different options for survey completion.* Flexible data collection methods improve retention (Prinz et al., 2001; Salyer et al., 1998). Thus, all participants had the option of doing their self-administered questionnaire online (i.e., via their home computer, one of our Belleville office computers, or some other computer), or by completing a paper version mailed to them.
3. *Having a permanent office in the region.* Having the QLS office in Belleville significantly increased the public profile and legitimacy of the project. It also allowed people to drop in at any time during the year and indicate any change in their contact information. For the purposes of cultivating goodwill in the community, the local office also purchased all office supplies locally (furniture, food, computers, etc.). About 11% of participants routinely chose to do their annual assessments in the QLS office, facilitating engagement with office staff, which is also known to improve retention.
4. *Having a website.* Our secure www.qeri.ca website where people logged on to do their assessment also provided reassurance of legitimacy; a means of communicating to the cohort and for cohort participants to communicate to us; and a transparent presentation of the purpose and status of the project for both the funder (OPGRC) and the general public.
5. *Providing incentives for participants.* Financial incentives to participants are known to improve retention (Collins et al., 2000; Prinz et al., 2001; Rudy et al., 1994). Thus, participants were paid $50 for Assessment 1, $30 for Assessment 2, $30 for Assessment 3, $35 for Assessment 4, and $35 for Assessment 5.
6. *Having a well-tested questionnaire*. All staff and both of the principal investigators were administered the questionnaire several times prior to each assessment to ensure the programming and questionnaire branching was robust, the meaning of each question was clear, and all appropriate answer variations would be accepted.
7. *Having an efficient questionnaire without redundancies*. All staff and both principal investigators were vigilant to unnecessary redundancies in the questions, which irritate participants and contribute to attrition. Hence, with the exception of our problem gambling instruments, we minimized the administration of standardized instruments having overlapping content.

---

[10] As well as identifying and discussing the many factors that contributed to the high retention rate, this 230 page companion document also provides a number of practical tools and templates to assist other longitudinal studies in achieving similar retention rates.

8. *Have an easily remembered project logo.* The QERI logo was used on the exterior office signage, the website, and on all outbound communications (including cheques). This 'branding' allowed participants to easily identify project mailings and distinguish them from the large volume of junk mail/email participants receive.

9. *Hiring the right people to recruit and maintain the cohort.* Research indicates that the degree to which participants are personally engaged with the people conducting the study is probably the most important factor in retention (Boots-Miller et al., 1998; Cotter et al., 2002; Salyer et al., 1998). This was our experience as well. It is typical for longitudinal studies to hire a large number of part-time employees who are often university students. However, a) hiring a large number of part-time employees decreases the likelihood of the cohort developing personal engagement with the team; b) the cohort may have greater difficulty relating to university students because of differences in age and educational level; c) students may not be from the local area; and d) students are less likely to stay for the duration of the study. In contrast, the QLS hired a full time Office Manager (Patricia McLaughlin) and 3 part-time Research Assistants (Nick White, Kate King, Danny Rose) who were long-time residents of the Quinte region. Also, rather than hiring students or others working in academia, our hiring strategies focused on finding individuals who had excellent people skills and organizational ability. Furthermore, as all of these individuals were retired, it was our expectation that they would stay for the duration of the project (which they did).

10. *Providing incentives for staff.* A $3,000 bonus was paid to the Office Manager and $4,000 to the Research Assistants (collectively) if they attained a 95% retention of the cohort from the previous assessment period (a goal they exceeded each time). This 95% target was also useful in providing a clear goal to work toward. Equally, if not more important than the monetary incentives, were the nonmonetary rewards. As the skill and success of the Quinte Office Team became more evident, they were given increasing authority and decision-making power concerning procedures and strategies for cohort retention.

11. *Being attentive to the needs of each and every participant.* Even though longitudinal studies are often important and interesting to the investigators, they are often emotionally draining, boring, and time consuming for participants. This was offset by ensuring participants had a positive interaction with our professional, enthusiastic, and supportive staff, and that all participant complaints and suggestions were responded to in a timely way. The motto of the Quinte Office Team was that the experience of each completed assessment shapes the person's motivation for the next one.

12. *Development of a comprehensive and versatile 'Contact Database'.* One of the manifestations of giving staff authority to devise improved techniques for retention was the development of a comprehensive and versatile database of information pertinent to each participant. Having multiple means of contacting and tracking participants improves retention (Cotter et al., 2002; Morrison et al., 1997). Consequently, we obtained each participant's home, cell, and work phone numbers; home and work addresses; home and work emails; vacation home address and phone number; ID on any social networking sites (e.g., Facebook, Flickr) [11]; and complete contact details for two people the person identified as being most likely to know how to contact him/her. This Contact Database also had an

---

[11] The QLS project maintained a presence on both of these sites.

appointment scheduler; registered the time and content of all phone calls made, emails sent, and mailed invitations; registered whether any email bounce-backs or nondeliverable mail were received; the participant's preferred method of contact; times the participant logged in and logged off of the survey; when their cheque was sent and who issued it; whether the last assessment was completed in the QLS office or some other place (e.g., home, library); identification of any special assessment needs (i.e., wheelchair, visual problems, etc.); whether technical difficulties had been previously encountered and the likely source of the problem (e.g., Internet browser, Internet Service Provider); and a 'Notes' field for the Research Assistants to document any other relevant issues. The Contact Database also had a very sophisticated set of 'progress indicators' that calculated retention and completion rates as a function of several different variables (e.g., whether participants received either an email or mailed invitation first, the day of the week the invitation was sent, the day of the week the invitation was likely received, the number of reminder phone calls made, length of time it took the person to complete prior assessments, etc.). Ongoing analysis of this data enabled the QLS Office Team to continually fine-tune and optimize their re-recruitment approach and develop mathematical models that accurately predicted completion rates and retention.

13. *Using staff time efficiently.* The Contact Database identified that roughly two-thirds of participants completed their assessment with nothing more than a single invitation. On the other hand, about one-third repeatedly required multiple reminders and/or office-based completion and/or some type of assistance. Significant time and monetary savings were achieved by identifying these latter individuals and focusing staff efforts on them.

14. *Being attentive to the format, content and timing of assessment invitations/reminders.* An analysis of the impact of invitations and reminders led to a protocol whereby the initial invitation consisted of a *personalized* letter invitation (returned mail also alerted staff to participants who had moved). If this was insufficient, it was followed with a *personalized* email invitation; followed by a *personalized* postcard reminder; followed by an email reminder; followed with a phone call(s). Invitations/reminders were usually sent at the beginning of the week, as people were much less likely to complete the assessment on weekends and holidays. Mass email required ongoing attention and working with the Internet Service Provider to avoid spam filter triggers and capacity limitations.

15. *Maintaining contact between assessments.* A newsletter was mailed out each summer that talked about the importance of the project, progress to date, and reminding people to contact the office if their address changed. In addition to maintaining rapport, returned mail allowed staff to identify changed addresses well in advance of the next assessment.

16. *Having a small stable and cohesive team, all of whom are highly engaged in the project and all of whom have clear roles and hierarchical decision making power.* In general, success at conducting a large scale longitudinal study is not due to a few critical things, but a thousand little things and the ongoing ability to quickly identify and rectify the many issues that continually arise.

Questionnaire

Administration

The questionnaire was self-administered and provided online (hosted by a server at the University of Lethbridge). This was considered to be the optimal format due to the fact that a) self-administration improves the reliability and validity of self-reported sensitive information (Aquilino, 1997; Schaeffer, 2000; Tourangeau & Smith, 1996; Tourangeau & Yan, 2007; van der Heijden et al., 2000); b) online self-administration allows people to proceed at their own pace at a time that is convenient to them; and c) computerized administration with the data automatically converted into an electronic data file minimizes the potential for transcription errors.

Participants had the option of completing the questionnaire on one of the 10 computer stations in the QLS Belleville office, or from some other computer (typically the person's home computer, but also could be a computer at a public library or some other location). A total of 29.6% opted to do the assessment at a QLS office computer in Assessment 1, with this proportion decreasing to 11.3% in Assessment 2 and staying at 11% to 10% beyond that point. A small percentage of people also requested and completed a paper and pencil version of the questionnaire, with this percentage varying between 0.8% and 1.8% depending on the assessment year. The option of being able to do the computerized assessment at the QLS office and/or via a paper-and-pencil format significantly improved the representativeness of the sample, a significant percentage of whom would not have been retained otherwise due to their unfamiliarity and/or dislike of computers. In general, males and older people had a greater tendency to do the assessment in the Belleville office and older people had a greater tendency to do the assessment in a paper and pencil format.

The questionnaire was readministered to all participants on an annual basis, usually beginning on November 1. A 12 month inter-assessment interval was utilized partly for logistical reasons in that it generally takes several months to assess several thousand people. However, there are scientific benefits as well. For one, a fixed annual assessment period allows participants to notify research staff in advance if they expect to be away during that time period. For another, it minimizes seasonal influences on the data, as gambling tends to increase to some extent during the summer months and Christmas.[12] Finally, it improves the quality of the data, as many of the questions and instruments ask about behaviour in the past 12 months. Thus, 12 months provides 'coverage' of the entire 5 year time period as well as facilitating accurate recall, as the previous assessment provides a memorable demarcation point for the current 12 month period being assessed.

---

[12] Because longitudinal analyses focus on changes from year to year, it would be disadvantageous if assessments occurred in December one year, February the next year, May the next year, and perhaps December again the following year.

Participants had a 5 month assessment window in which to complete their annual assessment, generally November 1 to March 31. Five months was chosen as the appropriate balance between the goal of maximizing retention and the goal of maximizing data quality. Although longer assessment windows increase retention, they also increase the variability of the inter-assessment interval between people and within the same person over the course of the study (i.e., not the 12 month period that is desired). This results in 'noise' within the data.[13] While the 5 month QLS assessment window also creates some noise, it is fairly minimal due to the fact that 90% of the cohort generally completing their assessment within the first 3 months of the assessment window (see table below).

Assessment 1 took a median time 83.5 minutes to complete and a modal time of 64.1 minutes.[14] Subsequent assessments took significantly less time due to greater familiarity with the questionnaire as well as the fact that several questions and/or tests assessing stable characteristics were only administered during Assessment 1. Upon completion of the assessment, participants were paid between $30 and $50 depending on the assessment year.

The details of these QLS assessment parameters are contained below in Table 7.

Table 7. QLS Assessment Parameters.

Assessment	Date	Completion Date for 90% of Cohort	Completing at Belleville Office	Paper & Pencil Format	Median Completion Time (minutes)	Payment
1	November 2006 – March 2007	Feb 14	29.6%	1.8%	83.5	$50
2	December 2007 – April 2008	Mar 5	11.3%	0.8%	44.8	$30
3	November 2008 – March 2009	Feb 8	11.0%	0.8%	53.8	$30
4	November 2009 – March 2010	Jan 24	11.1%	0.8%	38.0	$35
5	November 2010 – March 2011	Jan 18	10.1%	1.1%	35.4	$35

---

[13] For example, an 8 month assessment window with a 12 month inter-assessment interval means that the actual length of time between an individual finishing an assessment and doing it again can be as short as 4 months or as long as 20 months. Because many of the questions ask about past 12 month behaviour, an individual doing their assessment 4 months after their previous one will be reporting on much of the same behaviour for 2 assessments in a row. Also, because the analyses are focused on *changes* from one assessment to the next, it means that changes occurring after 4 months are given equal weight to changes occurring after 20 months. An additional problem is that longer assessment windows increase the likelihood that part of the cohort will be exposed to an important environmental event (e.g., change in gambling availability or policy; economic downturn) and another part of the cohort will not have that exposure.

[14] Median and modal times are more meaningful than the average time, as the only data available is log-in and log-out time. There are a small number of people who logged in then spent several hours doing something other than the questionnaire before finally completing the survey much later in the day (or sometimes the following day).

Content

The assessment comprehensively assessed all variables thought to be of potential etiological relevance to gambling, problem gambling, and the potential impact of a new gambling venue (roughly 135 variables). Table 8 identifies these areas, subareas, and the tests and/or questions used to assess each area/subarea. A description of the psychometric instruments used follows this table. The actual questionnaire employed in Assessment 1 is contained in Appendix B.

All variables and/or tests were administered in every assessment period (Assessment 1 = A1, Assessment 2 = A2, Assessment 3 = A3, Assessment 4 = A4, Assessment 5 = A5) unless otherwise noted. An 'X' indicates the variable was assessed in that time period and a blank cell indicates it was not. Many stable variables were only assessed once. Many other variables were experimental and/or ancillary and were not routinely assessed. The column 'Time' refers to the time frame in which the variable was assessed (i.e., lifetime, past 12 months, or currently).

Table 8. QLS Assessment Content.

		TIME	A1	A2	A3	A4	A5
DEMOGRAPHICS							
CONTACT INFORMATION	• Name • Home and work address • Home and work phone numbers • Home and work e-mail • Names, telephone numbers, and emails of 2 people with best idea of how to contact you	Currently	X	X	X	X	X
DEMOGRAPHICS	• Gender • Birth date • Country of birth • # years living in Quinte region • Ethnic origins • Were you adopted • Birth order • Who were you primarily raised by (biological, adoptive, step, other parents) • Highest level of education • Any children • Age and gender of stepchildren	Not applicable	X				
	• Age and gender of biological children	Currently	X			X	X
	• Are new children biological, step, or adopted; gender of new biological children	Currently			X	X	X
	• # years in current marriage or common-law relationship • Spouse's current age • Spouse's highest level of education • Spouse's occupation	Currently			X	X	
	• Any additional children in past year • Marital status • # people in household • Employment status • Current occupation • Household income • Household debt	Currently and/or past 12 months	X	X	X	X	X
	• Has recent economic downturn affected your disposable income	Past 12 months				X	
PHYSICAL HEALTH							
PHYSICAL FUNCTIONALITY	• Presence of physical disability or chronic health problem • Name of physical disability or chronic health problem	Currently	X	X	X	X	X
HEALTH STATUS	• General physical health rating • Frequency of visiting doctor, clinic, or hospital • Frequency of exercise	Past 12 months	X	X	X	X	X
	• Height & weight • Any prescription medications; their purpose; start date	Currently	X	X	X	X	X
	• Spouse's weight	Currently			X		

		TIME	A1	A2	A3	A4	A5
GAMBLING							
GAMBLING ATTITUDES	• Gambling Attitudes Measure (Williams, 2003) (3 questions on benefit/harm of gambling; whether gambling is morally wrong; opinion about legalized gambling)	Currently	X	X	X	X	X
LIFETIME GAMBLING	• Activities gambled on in lifetime • Age first gambled for money • Gambling frequency prior to 19 • Big win or big loss prior to 19 • Family members regular gamblers; which ones; did they gamble with you • Family members problem gamblers; which ones • Biggest lifetime win and biggest loss; how long ago; what was the win/loss on • Estimated lifetime net loss (or win) on gambling • Lifetime personal history of problem gambling beyond past 12 months • Have you overcome your problem gambling; how (open-ended)	Lifetime	X	X			
PAST YEAR GAMBLING BEHAVIOUR	• Types of gambling engaged in (lottery tickets; instant win tickets; electronic gambling machines; casino table games; games of skill for money against other people; sports betting; horse or dog racing; high risk stocks, option futures or day trading; other forms of gambling) • Typical month frequency for each type of gambling • Typical month spending for each type of gambling • Venues patronized for horse racing and slot play • Biggest win & biggest loss in single day • Do you use the Internet (generally) • Gambling on the Internet; % of gambling on Internet	Past 12 months	X	X	X	X	X
	• Type of EGM played (minimum bet size; # lines played; typically play more than 1 credit/line) • Membership in Gambling Rewards program • Frequency of ATM use in gambling venues	Past 12 months		X	X	X	X
MOTIVATION FOR GAMBLING	• Main reason for gambling (excitement/entertainment/fun; win money; to escape or distract myself; to socialize; to support worthy causes; make me feel good about myself; other)	Currently	X	X	X	X	X
GAMBLING CONTEXT	• Typically gamble alone or with friends • Frequency of drinking alcohol while gambling • Frequency of tobacco use while gambling • Frequency of using street drugs while gambling	Past 12 months	X	X	X	X	X
GAMBLING SOCIAL EXPOSURE	• # close friends and family members who are regular gamblers • # close friend and family member who are problem gamblers • # adults living in household with gambling problems; relationship to person • Availability of opportunities to gamble at workplace or school • Exposure to any problem gambling prevention campaigns at workplace or school	Past 12 months	X	X	X	X	X
QUINTE EXHIBITION AND RACEWAY (QER)	• Awareness of the new QER-II with slots that is planned • Perceived positive or negative impact of new QER-II	Currently	X	X	X	X	X
	• Perceived benefits of QER-II (open-ended) • Perceived drawbacks of QER-II (open-ended) • Rating of expected impact of QER-II in 13 areas (e.g., employment, addiction, tourism, etc.)	Currently	X				

		TIME	A1	A2	A3	A4	A5
QER	• Frequency of visitation to existing Quinte Exhibition and Raceway • Spending per visit at existing QER; itemization of spending	Past 12 months	X				
	• Do you think that horse-racing will return to Belleville (horse racing ended 2006) • Do you think that the new QER-II will ever open	Currently				X	
PROBLEM GAMBLING	• Canadian Problem Gambling Index (CPGI) (Ferris & Wynne, 2001) • Problem & Pathological Gambling Measure (PPGM) (Williams & Volberg, 2010, 2014) • NORC DSM-IV Gambling Screen (NODS) (Gerstein et al., 1998) • Are there particular types of gambling contributing to problems more than others; identify • Causes of gambling problems (open-ended question asked of everyone with CPGI 3 or higher) • Sought help for gambling problems; where sought help from; nature of the help	Past 12 months	X	X	X	X	X
	• Wanted help for gambling problems • Entered into a casino self-exclusion contract • If recovered from problem gambling, a self-report of how this was accomplished (open-ended)	Past 12 months		X	X	X	X
	• % of household debt due to gambling	Currently			X	X	X
GAMBLING FALLACIES	• Gambling Fallacies Measure (Williams, 2003); 10 questions	Currently	X	X		X	X
GAMBLING VENUE PROXIMITY	• Calculated driving kilometers (using Google Maps) from home address to nearest Ontario casino or slots-at-race track • Calculated drive time (minutes) (using Google Maps) from home address to nearest Ontario casino or slots-at-race track	Currently	X	X	X	X	X
	• Self-reported distance to nearest casino or slots-at-race track from home • Estimated time to nearest casino or slots-at-race track from home • Self-reported distance to nearest casino or slots-at-race track from work • Estimated time to nearest casino or slots-at-race track from work	Currently				X	X
PERSONALITY							
• NEO Five Factor Inventory (Costa & McCrae, 1992) scores on each of the 5 main personality domains: Introversion – Extraversion; Neuroticism – Emotional Stability; Openness – Close-Mindedness; Agreeableness – Disagreeableness; Conscientiousness - Nonconscientiousness • In addition, the Depression, Vulnerability, and Impulsivity facets from Neuroticism domain and the Excitement-Seeking facet from the Extraversion domain were also administered from the full NEO Personality Inventory – Revised (Costa & McCrae, 1992)		Currently	X				
STRESS							
PAST YEAR STRESSORS	• adaptation of Life Events Questionnaire; Vuchinich, Tucker & Harllee, 1986) (58 life events in areas of work/school; family & friends; property & finances; legal matters/crime; health)	Past 12 months	X	X	X	X	X
WELL BEING	• Overall level of stress • Overall level of happiness • Overall level of life satisfaction	Past 12 months	X	X	X	X	X
	• Personal Wellbeing Index – Adult (International Wellbeing Group, 2013)	Currently			X	X	X

		TIME	A1	A2	A3	A4	A5
LIFETIME STRESSORS	• Physically, sexually, or emotionally abused as child • Trauma prior to past 12 months that still affects you today; identify	Lifetime	X				
VALUES							
• Which is most important to you: money, power, fame, friendships, none of these • Extent agree with statement "wealth is an important measure of success"		Currently				X	X
MENTAL HEALTH							
MENTAL DISORDERS	Adaptation of Composite International Diagnostic Interview – Short Form (CIDI-SF) 12 month DSM-IV, Version 1.1 (Kessler et al., 1998) + additional DSM-IV questions to assess: • Post-Traumatic Stress • Major Depression • Mania • Generalized Anxiety • Panic Attacks & Agoraphobia • Obsessive Compulsive Disorder • Bulimia • Schizophrenia & Delusional Disorder • If person had disorder, then asked open-ended question about causes; whether they had sought help; where from; nature of help (Assessment 1 only); and whether they had recovered from these problems	Past 12 months	X	X	X	X	X
SUBSTANCE USE, ABUSE, AND DEPENDENCE	Adaptation of Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) (WHO ASSIST Working Group, 2002) + PPGM (Williams & Volberg, 2010, 2014) • Substances used and frequency of use • Substance Abuse & Dependence • If person met criteria for abuse or dependence, they were asked open-ended question about causes; whether they had ever sought help; where they sought help from; nature of the help (Assessment 1 only);and whether they have recovered from these problems • # adults in household with a substance abuse problem; relationship	Past 12 months	X	X	X	X	X
BEHAVIOURAL ADDICTIONS	Behavioural Addiction Measure (BAM) (an adaptation of the Problem and Pathological Gambling Measure (PPGM) (Williams & Volberg, 2010, 2014)) • sex or pornography; exercise; shopping; Internet chat lines; video or Internet gaming; over-eating (Not asked in Assessment 1); other addictions • If person met addiction criteria, asked open-ended question about causes for these problems; whether they had ever sought help; where they sought help from; nature of the help (Assessment 1 only); and whether they have recovered	Past 12 months	X	X	X	X	X

		TIME	A1	A2	A3	A4	A5
LIFETIME MENTAL HEALTH HISTORY	• Drug or alcohol addiction; identify substance(s) • Other behavioural addiction; identify type • Mental health disorders; identify type • Any family members with history of addiction; identify who and specific addiction • Any family members with history of mental health problems; identify who and specific mental health problem	Lifetime	X				
SOCIAL FUNCTIONING							
SEXUAL ORIENTATION	• Sexual orientation	Currently	X				
SOCIAL FUNCTIONING & SUPPORT	• Kansas Marital Satisfaction Scale (Schumm et al., 1986) (3 questions)	Currently	X	X	X	X	X
	• Social Nonsupport Scale (8 questions) from Personality Assessment Inventory (PAI) (Morey, 1997)	Currently	X	X	X	X	X
	• Rating of family functioning	Past 12 months	X	X	X	X	X
COMMUNITY QUALITY	First 2 questions from Buckner Neighborhood Cohesion Scale (Buckner, 1988) • There is a strong sense of community in my neighborhood • My neighborhood is a good place to live • Quinte region is good place to live	Currently	X	X	X	X	X
COMMUNITY INVOLVEMENT	• Actively involved in clubs, groups, and organizations in my community • Actively involved in volunteer activities in my community • Actively involved in the public life of my community	Currently	X	X	X	X	X
RELIGION	• Religious affiliation • Rohrbaugh Jessor Religiosity Scale (Boivin, 1999; Nicholas & Durrheim, 1996)	Currently	X				
PARANORMAL BELIEFS[15]	• Belief in reincarnation • Belief in ghosts • Belief in extra-sensory perception • Belief in astrology	Currently	X				
POLITICAL ORIENTATION	• Political views of which party most closely resemble your own	Currently	X				
RECREATIONAL ACTIVITIES	• Rank order of 5 favourite leisure activities from a list of 25 provided (gambling included as one of the items) (only 19 listed in Assessment 1)	Currently	X	X	X	X	X
OCCUPATIONAL FUNCTIONING	• Overall job stress • Overall job satisfaction	Past 12 months	X	X	X	X	X

---

[15] Paranormal beliefs was arbitrarily put into the Social Functioning Section.

		TIME	A1	A2	A3	A4	A5
ILLEGAL BEHAVIOUR AND ANTISOCIALITY	• Lifetime engagement in various illegal activities • Ever been charged; number of charges; which offences • Ever been convicted; number of convictions • Ever been incarcerated • Antisocial Scale from Personality Assessment Inventory (PAI) (Morey, 2007)	Lifetime	X				
	• Involvement in various illegal activities in past 12 months	Past 12 months	X	X	X	X	X
INTELLIGENCE							
• Matrices subtest from Stanford Binet Fourth Edition (Thorndike, Hagen & Sattler, 1986)		Currently			X		

Psychometric Instruments: Gambling Area

The ***Gambling Attitudes Measure (GAM)*** (Williams, 2003) consists of 3 questions on the benefit/harm of gambling; whether gambling is morally wrong; and the person's opinion about legalized gambling. This instrument has low internal consistency (Cronbach alpha = .57) due to just having 3 questions and the fact that each question addresses a somewhat different issue (which is why the instrument is described as a "measure" rather than a "scale"). However, one month test-retest reliability is good (r = .78, p < .01 using a sample of 585 first year university students in Alberta in 2002/2003; r = .73, p < .01 using a random sample of 491 Canadian adults in 2006/2007). Concurrent validity is established by the GAM's significant positive correlation with current gambling involvement in all studies the first author has conducted (8 studies with ~30,000 participants). The overall magnitude of the correlation is only moderate (ranging from r = .25 to r = .50), which is partly due to the fact that some of the people with the highest levels of involvement (problem gamblers), have very negative attitudes toward gambling. The strength of this correlation is lower for money spent gambling compared to time spent gambling, frequency of gambling, and number of gambling formats engaged in. Predictive validity is established by GAM's significant positive correlation with future gambling involvement in all studies the first author has conducted (3 studies with ~6,500 participants; all correlations of similar magnitude to those established with concurrent validity).

Gambling expenditure was assessed using question wording that has been shown to produce the best correspondence with actual expenditure (Wood & Williams, 2007). This is not a trivial concern, as the general reliability and validity of retrospective reports of gambling expenditure tends to be quite poor (Blaszczynski, Dumlao & Lange, 1997; Hodgins & Makarchuk, 2003; Wood & Williams, 2007). Essentially, the questions used in the present study asked people "Roughly how much money do you spend on [gambling type] in a typical month? ('spend' means how much you are ahead (+$) or behind (-$), or your net win or loss in an average month in the past 12 months).

Three measures of problem gambling were used. The first was the ***National Opinion Research Centre Screen for DSM-IV Pathological Gambling (NODS)*** (Gerstein et al., 1999)[16]. This is a 10 question past year operationalization of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000) criteria for pathological gambling. Conventionally, a score of 3-4 is used to identify Problem Gamblers and a score of 5 and higher to identify Pathological Gamblers. The second measure of problem gambling used was the ***Canadian Problem Gambling Index*** (CPGI) (Ferris & Wynne, 2001). This 9 item instrument conventionally has 5 categories of past-year gambling: Non-Gamblers; Non-Problem Gambler (CPGI = 0), Low Risk Gambler (CPGI = 1-2), Moderate Risk Gambler (CPGI =3-7), and Severe Problem Gambler (CPGI = 8-27). Both the NODS and CPGI have good internal consistency as well as test-test reliability (Abbott & Volberg, 2006; Neal, Delfabbro & O'Neil, 2005; Stinchfield, Govoni & Frisch, 2007; Williams & Volberg, 2010). However, the classification

---

[16] The primary purpose of including the NODS in the QLS was to compare its performance relative to the other two problem gambling instruments. The present report does not contain these comparative results.

accuracy of the CPGI against clinical assessment is only fair (kappa = .55) and the NODS is only moderate (kappa = .68) (Williams & Volberg, 2010, 2014). The empirical basis for the cut-offs used in delineating the 5 CPGI categories is also weak (Currie, Hodgins & Casey, 2013; McCready & Adlaf, 2006). Confirmation of this has been found in 2 comprehensive empirical investigations, where an improvement in the classification accuracy of the CPGI was demonstrated when a 5+ cut-off rather than 8+ cut-off was used to designate problem gambling (kappa increased to .69) (Williams & Volberg, 2010, 2014; see also Currie, Hodgins & Casey, 2013). Hence, a 5+ cut-off for problem gambling was also used in the present study, and the traditional CPGI categories were changed to: Non-Gambler; Non-Problem Gambler (CPGI score of 0); At Risk Gambler (CPGI = 1-4); and Problem Gamblers (CPGI 5-27).

The primary instrument used to assess problem gambling in the QLS was the **Problem and Pathological Gambling Measure (PPGM)** (Williams & Volberg, 2010, 2014) (the instrument itself is contained in Appendix C). The PPGM is a 14 item instrument that classifies people into 5 categories: Non-Gambler; Recreational Gambler; At Risk Gambler; Problem Gambler; and Pathological Gambler. The PPGM also has good internal consistency (Cronbach alpha = .76 - .81 depending on the dataset) as well as one month test-retest reliability (r = .78) (Williams & Volberg, 2010, 2014). However, it has considerably better overall classification accuracy (kappa = .96) compared to the CPGI and NODS (Williams & Volberg, 2010, 2014). The superior performance of the PPGM is due to several factors. One is that any pattern of item endorsement that results in a score above a certain threshold is sufficient to be designated as a problem gambler in the CPGI and DSM (despite the fact that some items are more serious and/or diagnostic than others). Consequently, it is possible to be classified as a problem/pathological gambler without actually endorsing any significant problems or harm deriving from one's gambling. Similarly, it is possible to indicate the presence of significant problems deriving from one's gambling on the CPGI and DSM without being classified as a problem gambler. (Which is why instruments such as the CPGI have been criticized for lacking face validity (Svetieva & Walker, 2008)). Most researchers in the field of gambling studies would agree that for someone to be a problem gambler there needs to be evidence of a) significant negative consequences, and b) impaired control (Neal, Delfabbro & O'Neil, 2005). Having unambiguous evidence of both of these features is explicitly required in the PPGM for a designation of problem gambling.

A second reason is that the PPGM assesses *all* potential harms deriving from gambling (i.e., financial, mental health, relationship, physical health, work/school, illegal behaviour), whereas only a subset of potential problems are assessed with the DSM and CPGI. Mental health problems and physical health problems are not assessed in the DSM. School and work problems are not covered in the CPGI. Engagement in illegal activities to support gambling is not addressed in the CPGI.[17] Financial problems are not well addressed in the DSM (i.e., the

---

[17] Illegal acts to support gambling was dropped as a criterion for disordered gambling in DSM-V due to its infrequent endorsement. The problem with this approach is that people with less common patterns of problem gambling no longer get correctly identified as problem gamblers. More discussion of this issue is contained later in this report.

DSM question asks whether the person relies on others to provide money). Similarly, not all the signs and symptoms of impaired control are covered. For example, the CPGI does not assess whether the person has experienced any problems in cutting back or stopping gambling.

A final reason for the superior classification accuracy of the PPGM is because it endeavors to minimize false positives and false negatives. The former is accomplished by requiring the person to report gambling at least once a month in the past year to be classified as a problem gambler (no corroborating gambling behavior is required in the CPGI or DSM). The latter is accomplished by allowing for problem gambling designation of individuals reporting sub-threshold levels of symptomatology if their gambling expenditure and frequency are equal to those of unambiguously identified problem gamblers. Denial is common among people with addictions and yet the PPGM is the only instrument that attempts to address this issue.

Gambling fallacies were assessed in the QLS with the **Gambling Fallacies Measure (GFM)** (Williams, 2003). The GFM is a 10 item questionnaire addressing common gambling fallacies: failure to understand the independence of random events; belief that one is luckier than other people; illusion of control; believing in or being susceptible to superstitious conditioning; ignoring or being unaware of the statistical probabilities when gambling; insensitivity to sample size in calculating odds; insensitivity to the law of large numbers; and applying stereotypic notions of randomness. Internal consistency of the GFM is low (Cronbach alpha = .51; n = 2080 randomly selected Canadian adults in 2006/2007), which reflects the fact these 10 questions are assessing a wide range of different fallacies. However, one month test-retest reliability is relatively good (r = .70; random sample of 2080 Canadian adults in 2006/2007). Concurrent validity is established by the GFM's significant positive correlation with current gambling involvement (r = .10 for number of types engaged in; r = .13 for frequency of gambling; n = 3,936 Ontario adults in 2006/2007), paranormal beliefs (r = .14 to r = .22 depending on the specific paranormal belief; random sample of 2,091 adults in 2006/2007) as well as problem gambling status (r = .11 to r = .15 depending on the study). In general, the magnitude of the correlations between gambling fallacies and gambling involvement are consistently positive, but low. This is due to the fact that very high rates of gambling fallacies also tend to be present in nongamblers and recreational gamblers.

Psychometric Instruments: Personality Area

Personality was assessed with the **NEO Five Factor Inventory (NEO-FFI)**, which is a 60 question short form version of the 240 question **NEO Personality Inventory - Revised (NEO PI-R)** (Costa & McCrae, 1992). The NEO is currently the dominant instrument in the assessment of personality, providing a score in the 5 major personality domains of Introversion versus Extraversion; Neuroticism versus Emotional Stability; Openness versus Close-Mindedness; and Conscientiousness versus Lack of Conscientiousness. The full NEO-PI-R also provides scores in 6 facets of each personality domain. In the present study, the questions from the NEO-PI-R comprising the facets of Depression, Vulnerability, Impulsivity, and Excitement-Seeking were also included. Internal reliability of the NEO-PI-R domain scores are known to be high, ranging

from .86 to .92, and the internal reliabilities of the facets range from .58 to .82 (Costa & McCrae, 1992). The concurrent and discriminant validity of the NEO has been well established in both normal and clinical populations (Costa & McCrae, 1992).

Psychometric Instruments: Stress Area

An adaptation of the **Life Events Questionnaire** (LEQ; Vuchinich, Tucker & Harllee, 1986) was used to assess the past year occurrence of 58 significant life events grouped into the areas of work/school (e.g., started a new job); family and friends (e.g., son or daughter left home); property and finances (e.g., suffered a significant financial loss); legal matters and crime (e.g., was assaulted); and health (e.g., developed a serious physical illness). A total event score was calculated. The LEQ has been shown to have good agreement with collateral reports (Tucker et al., 1994) and to have excellent retest reliability over a two-week period (Vuchinich et al., 1986). A subset of items consisting exclusively of **Negative Life Events** was also created for the present study.

The **Personal Wellbeing Index – Adult (PWI-A)** asks people to rate their level of satisfaction in 8 areas: standard of living, health, achieving in life, relationships, safety, community-connectedness, future security, and spirituality/religion (International Wellbeing Group, 2013). The basic psychometric characteristics of the PWI in Australian samples have been described (Cummins et al., 2003), while more detailed data concerning scale composition, reliability, validity, and sensitivity are provided in other reports on the Australian Unity Wellbeing Index (Lau, Cummins & McPherson, 2004; Tiliouine, Cummins & Davern, 2005). In general, research has shown that the 8 domains consistently form a single stable factor accounting for about 50% of the variance (International Wellbeing Group, 2013). In terms of convergent validity, a correlation of .78 with the Satisfaction with Life Scale (Diener, Emmons, Larsen & Griffin, 1985) has been reported (International Wellbeing Group, 2013). Cronbach alpha ranges from .70 to .85 (International Wellbeing Group, 2013), and there is good test-retest reliability across 1-week and 2-week intervals (Lau & Cummins, 2005).

Psychometric Instruments: Mental Health Area

Mental disorders were assessed with an adaptation of the World Health Organization's (WHO) **Composite International Diagnostic Interview (CIDI)** (Kessler et al., 1998). The CIDI-SF is the short form of the WHO's assessment of mental disorders using diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders (DSM) (APA, 2000). CIDI-SF questions were used to assess major depression, generalized anxiety disorder, panic attacks and agoraphobia, and obsessive compulsive disorder. In the present study, the present authors operationalized DSM-IV criteria so as to also assess post-traumatic stress disorder, manic episodes, bulimia, schizophrenia, and delusional disorder.

Substance use, abuse, and dependence were assessed using an adaptation of the World Health Organization **Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)** (WHO

ASSIST Working Group, 2002) and the **Problem and Pathological Gambling Measure (PPGM)** (Williams & Volberg, 2010, 2014). People were first asked which substances they had used in the past 12 months. For every substance used participants were asked how frequent their use had been. They were then asked separate questions concerning whether their past 12 month use of these substances had caused any significant financial, mental, relationship/family, physical health, mental health, legal, school or work problems for themselves or someone close to them, or whether there was anyone else who would indicate the person's use of these substances had caused significant problems. A person was classified as a substance abuser if they answered yes to any question indicating a significant problem had occurred. A person was designated as being substance dependent if at least one significant problem had occurred and they scored an additional 3 points by also endorsing questions about loss of control, tolerance, preoccupation, and/or withdrawal and/or they reported a wide range of problems in the previous questions (a more extensive range of significant problems could only account for 2 points toward the total of 3).

The **Behavioural Addiction Measure (BAM)** is also an adaptation of the Problem and Pathological Gambling Measure (PPGM) (Williams & Volberg, 2010, 2014). A screening question was created for the BAM that asked people whether there are "other activities that you engage in where your over-involvement has caused significant problems for you in the past 12 months"? They are then asked to check off any from the following list that applied: sex or pornography; exercise; shopping; Internet chat lines; video or Internet gaming; or other (specify). (Note: over-eating was added in Assessment 2 due to its very frequent report in the category of 'other' in Assessment 1). They were then asked how often they had engaged in each of these activities in the past 12 months. People who reported engaging in the activity a few times a week or more were asked additional questions concerning whether their past 12 month involvement in this activity had caused any significant financial, mental, relationship/family, physical health, mental health, legal, school or work problems for themselves or someone close to them, and/or whether there was anyone else who would indicate the person's involvement had caused significant problems. A person was classified as having problematic levels of involvement if they answered yes to any of these questions. A person was designated as having an addictive level of involvement if they answered yes to any of these questions and also endorsed questions indicating either some loss of control, tolerance, attempts to cut back, withdrawal symptoms, or strong cravings. This instrument has not received any psychometric evaluation to date.

Psychometric Instruments: Social Functioning Area

Marital satisfaction was measured using the **Kansas Marital Satisfaction Scale** (Schumm et al., 1985, 1986). The 3 items comprising this scale are: "How satisfied are you with your (common law) marriage?", "How satisfied are you with your husband/wife/partner as a spouse?", and "How satisfied are you with your relationship with your husband/wife/partner?" This scale has reasonably good internal consistency reliability, test-retest reliability, construct validity, and

criterion-related validity (equivalent to much longer scales in current use) (Schumm et al., 1985, 1986).

Community quality was assessed using two items from the **Buckner Neighborhood Cohesion Scale** (Buckner, 1988): "There is a strong sense of community in my neighbourhood" and "My neighbourhood is a good place to live". This was supplemented by a third question concerning whether the person believed the Quinte region was a good place to live.

Lack of social support was assessed with the Social Non-Support scale (8 questions) from the **Personality Assessment Inventory (PAI)** (Morey, 2007)*.* Antisociality was also assessed using the Antisocial Features scale (24 questions) from the PAI (Morey, 2007). The full PAI has a total of 344 items, assessing a comprehensive range of clinical entities: somatic complaints, anxiety, anxiety-related disorders, depression, mania, paranoia, schizophrenia, borderline features, antisocial features, alcohol problems, and drug problems. The 5 treatment scales are: aggression, suicidal ideation, stress, social non-support, and treatment rejection. The PAI has been used on a wide variety of populations and has well established reliability and validity (Morey, 2007; Morey & Hopwood, 2006).

Religiosity was measured using the **Rohrbaugh Jessor Religiosity Scale** (Rohrbaugh & Jessor, 1975). This 8 item measure was developed to evaluate the importance that religion has on the person's life, the strength of the person's religious beliefs, and the extent to which the person participates in religious practices. This scale has high internal consistency and very good overall reliability and validity.

Psychometric Instruments: Intelligence Area

General intelligence was estimated using the **Matrices Subtest of the Stanford-Binet Intelligence Test 4th Edition** (Thorndike, Hagen & Sattler, 1986). This subtest consists of 26 items and is from the Abstract/Visual Reasoning Area of the Stanford-Binet. Each item provides a pictorial matrix of either 4 or 9 items with one of the cells blank. The person uses their reasoning ability to determine the pattern or principle contained in the matrix so as to determine which of the 4 options provided best fits the missing cell. The Matrices subtest is modeled after the Raven Progressive Matrices, which is intended to be a culture-free measure of general intelligence ('g'). Factor analytic studies have confirmed the Stanford-Binet Matrices to be a good measure of g (accounting for 55% of the variance), as well as having a Pearson correlation of .78 with the overall Stanford-Binet Composite IQ (Sattler, 1988).

Journals

At the end of Assessment 1 people were asked if they could also complete a 'journal' (either a paper-and-pencil journal offered to participants after their assessment at the QLS Belleville office, or an electronic journal filled out online on the www.qeri.ca website). It was explained that the purpose of this journal was to a) provide a better 'real time' understanding of changes in behaviour between assessments, and b) reduce the person's reliance on memory at the next assessment. It was also explained that these journals were voluntary, not required for participating in the annual assessments or receiving their monetary compensation.

People who agreed to complete these journals were asked to record 2 things:
1. Any significant life event (i.e., starting a new job, pregnancy, divorce, bankruptcy, victim of crime, etc.) and the date it occurred.
2. Any significant change in gambling behaviour, and the date it occurred, such as:
   - engaging in a new type of gambling for the first time
   - a significant increase or decrease in frequency or spending on a certain type of gambling
   - a large gambling win or large loss
   - the development or worsening of gambling problems
   - receiving treatment for problem gambling

Unfortunately, because of the low utilization of these journals (only about 1% of participants completed them prior to the beginning of Assessment 2), the journals were discontinued and not utilized in the analyses for this study.

Data Cleaning

The QLS dataset required very little data cleaning. There was very little 'noise' in the data due to the extensive testing and retesting of the online questionnaire by QLS staff and principal investigators prior to each assessment, which ensured the programming was robust, the meaning of each question was clear, and there were no unnecessary redundancies in the questions. A full time person (Beverly West) also comprehensively examined the dataset after each assessment to further ensure each variable, branching variable, and composite score was working as intended. Also, the programming of the questionnaire only allowed a restricted range of valid answers for each question, minimizing accidental or erroneous entries.

The dataset also contained very little missing data due to the fact most questions were mandatory (people could not proceed to the next question until entering an answer). An "unsure/don't know" option was available for questions having a high degree of sensitivity (e.g., household income), and/or questions where it was quite possible the person did not actually know the answer (e.g., whether a parent was a problem gambler). There were also only 15 partially completed questionnaires submitted out of the 19,583 collected over the 5 assessments (i.e., the questionnaire was completed up to the gambling section, allowing the

data to be included in the analysis, but the person did not complete the rest of the questionnaire). As a consequence, when missing data did occur, it generally constituted < 0.1% of the total data for that variable within the cohort. Missing value imputation was nonetheless undertaken for most continuous variables to produce an even more complete dataset. This was done by first determining whether there was any statistically significant correlation between reporting unsure/don't know and problem gambling status for the variable. When no association existed, the person's prior or subsequent years' data was used for imputation (i.e., imputing the average of the values reported by the person in the year before and the year after or imputing a value that had been consistently reported in the previous 2 or subsequent 2 years). When this approach was not possible, then the average value of the variable for the entire cohort in that assessment period was imputed.

Some consideration was also given to imputing missing *cases* in the situation where we had both the previous and subsequent year's data for that individual (i.e., by imputing either the same, median, or average value between the 2 data points). However, this was not undertaken due to the fact that a) this would have only increased the sample size by 2.3% for any analysis that require all time periods, and b) it would have also required imputation of the dependent variables, and the stability/instability of gambling and problem gambling was of central importance in this study.

Use of a Dichotomous rather than Continuous Dependent Variable

An important theoretical question concerns whether the dependent variable should be the presence or absence of problem gambling (a dichotomous approach) or the level of problem gambling symptomatology (a continuous approach).

Prior research, as well as data in the present study, indicates that problem gambling scores exist on a continuum. As an illustration, Figure 3 shows the distribution of problem gambling scores in Assessment 1 on the CPGI, PPGM, and the DSM-IV based NODS for everyone with a score of 1 or higher. The table below Figure 3 contains the raw numbers for each score level on each instrument. As can be seen, there is nothing in the distributions themselves that would indicate that 3+ for the NODS and 5+ for the CPGI (or any other score) provides a natural demarcation for problem gambling. (There is no score level that automatically demarcates problem gambling in the PPGM, although all problem gamblers will have a score of at least 2).

Figure 3. Distribution of Problem Gambling Scores in QLS Assessment 1.
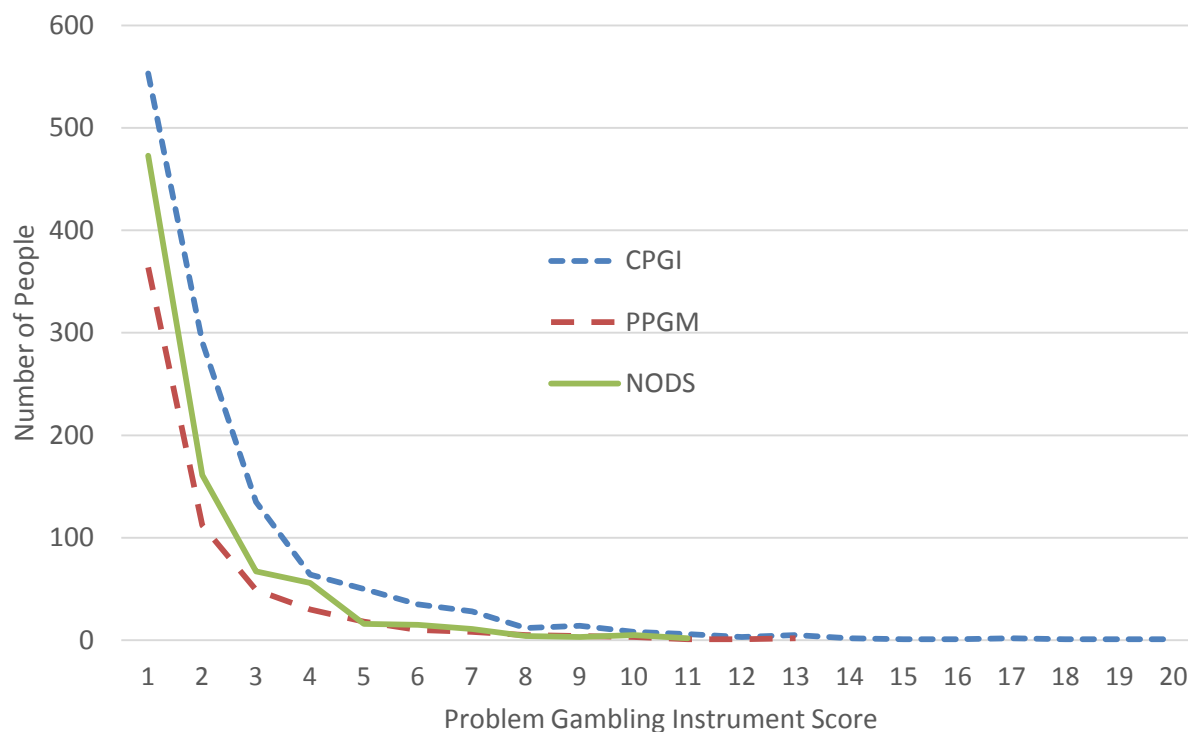
Table 9. Distribution of Problem Gambling Scores in QLS Assessment 1.

score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CPGI	553	291	135	64	50	35	28	12	14	8	6	3	5	2	1	1	2	1	1	1
NODS	473	161	67	56	16	15	11	4	3	5	2									
PPGM	364	112	49	30	18	10	8	5	4	3	1	1	2							

The fact that problem gambling scores exist on a continuum tends to support the contention that the best approach is to examine the relationship between independent variables and the *level* of problem gambling symptomatology. This is especially true for instruments such as the CPGI and DSM where problem gambling designation is determined by score level rather than the presence of specific diagnostic criteria. The other advantage of this continuous approach is that a categorical approach combines people with different score levels (e.g., people with CPGI = 5 with CPGI = 27) as well as people who have had a change score of 1 to become a problem gambler (e.g., CPGI = 4 to CPGI = 5) with people who have change scores of 10 (CPGI = 0 to CPGI = 10).

On the other hand, there are even stronger arguments for examining how independent variables relate to the dichotomous presence or absence of problem gambling. One difficulty with using a continuous dependent variable approach is that score changes below the problem

gambling level (e.g., CPGI change of 0 to 3) are given equal statistical weight to score changes that put a person into a problem gambling category (e.g., a CPGI change of 3 to 6). In fact, these clinically inconsequential changes are statistically given *much more weight* due to many more people having changes in these low nonclinical ranges. Subclinical problem gambling is not the same as problem gambling. Furthermore, as will be seen later in this report, although subclinical problem gambling is a risk factor for future problem gambling, the large majority of people with subclinical levels will transition back to recreational gambling rather than progress to problem gambling.

An equally important issue is that almost all forms of psychopathology (e.g., substance abuse, depression, anxiety) exist on a continuum. Nonetheless, there are certain levels of psychopathology that are conceptually distinct because they indicate the person has met clinical criteria for having a serious disorder in need of treatment. In the case of problem gambling, most researchers would say this is when the person reports impaired control over their gambling and has experienced significant harm deriving from this impaired control (Neal, Delfabbro & O'Neil, 2005). Hence, an argument can be made that what is really required is knowing the relationship between independent variables and their ability to cause these essential diagnostic elements resulting in this problem gambling designation.

This discussion also relates to how problem gambling is best conceptualized and assessed. Studies have shown that many problem gamblers tend to display a similar pattern of symptoms. This has led some people to see these common symptoms as manifestations of the underlying theoretical construct of problem gambling. Following on this logic, instruments such as the CPGI were then created with question selection statistically determined by how closely an item correlated with this set of 'core symptoms'.

While there is merit to this approach, it also has some serious problems. For one, the questions ultimately chosen for the CPGI were selected without regard to their relevance to the definition of problem gambling. Consequently, as mentioned earlier, it is possible to be classified as a problem gambler on the CPGI (and DSM) without actually endorsing any significant problems or harm deriving from one's gambling. Similarly, it is possible to indicate the presence of significant problems deriving from one's gambling without being classified as a problem gambler. Another issue is that scores on the CPGI only indicate how *similar* a person's symptoms are to this set of commonly correlated symptoms, and yet CPGI categories were created ostensibly to measure level of *severity* rather than level of similarity. A final issue concerns the fact that problem gambling is not a unitary entity. Although the current set of 9 CPGI questions tend to form a unitary factor (e.g., Miller, Currie, Hodgins & Casey, 2013), this is simply a result of the original set of 45 CPGI questions being winnowed down to eliminate the ones with low correlations with the other items and/or the total score (Ferris & Wynne, 2001). As a consequence, the number of problem gambling factors was artificially reduced from 3 to 1 (Ferris & Wynne, 2001).[18] The reality is that because there are multiple routes to problem

---

[18] The first author (RW) has found there to be 4 - 5 problem gambling factors when analyzing the pattern of responses to people who have completed the CPGI, PPGM, SOGS, and NODS (the 29 unique questions deriving

gambling and multiple contexts in which it develops, there are also multiple manifestations. Female problem gamblers tend to have a different profile compared to male problem gamblers (Beaver et al., 2010; Blaszczynski & Nower, 2002; Ledgerwood et al., 2012; van den Bos et al., 2013). Social problems can have more prominence than financial problems for Asian gamblers (Raylu & Oei, 2004). Financial problems can be less prominent for people with higher incomes. The point being made here is that a good assessment instrument is not one that requires 'one shoe to fit all', but one that correctly recognizes all the different manifestations of the disorder.

There is value in using statistical approaches to identify the most common symptoms of problem gambling and in understanding the typical sequencing of symptom appearance indicative of more severe forms. The utility of this information is that it identifies which items are better contenders for inclusion in an assessment instrument (e.g., Miller, Currie, Hodgins & Casey, 2013; Strong & Kahler, 2007; Strong et al., 2003; 2004; Toce-Gerstein, Gerstein & Volberg, 2003). However, it is even more important that the assessment instrument contain items needed for diagnostic identification; uses a scoring system that aligns with clinical criteria for the disorder; is able to recognize and capture the different manifestations of the condition; and can accommodate the different symptom sequencing that occurs as a function of age, gender and other characteristics (Faregh & Derevensky, 2011; Strong & Kahler, 2007). The PPGM accomplishes all of these goals, which is why it is the primary instrument used in the present study.[19]

Thus, the presence or absence of a problem gambling will be used as the dependent variable in the present analyses. This will consist of PPGM problem gambling status in the QLS and CPGI 5+ status in LLLP.

A Focus on Predictors Rather than Correlates of the Dependent Variable

As mentioned in the Introduction, correlates of concurrent problem gambling are useful for identifying variables that are potentially etiologically involved in the development of problem gambling. However, while some correlates will also be future predictors, many correlates will not be either because they developed as a *result* of problem gambling or developed concurrently with problem gambling. Because it is often not possible to disentangle the chronology of correlated independent variables relative to changes in the dependent variables, analyses that examine correlation in the same time period or covariation across time periods are not particularly informative and are not undertaken in the present study.

---

from these 4 instruments representing a fairly comprehensive and complete array of problem gambling symptomatology).

[19] Thus, instruments such as the CPGI are best seen as good approximations to the clinical entity of problem gambling. In the QLS, 100/170 (58.8%) of CPGI 5+ also met PPGM criteria for problem gambling in Assessment 1. For the DSM-IV derived NODS, there was a 51.4% (92/179) agreement with the PPGM in Assessment 1.

There are only a few circumstances where examination of correlates (in addition to predictors) may be warranted in a study focused on etiology:

- When the value of the independent variable does not change over time. Roughly 25% of the variables in the present study have this characteristic. Examples are demographic characteristics such as gender and ethnicity, as well as potentially personality, intelligence, and events occurring in the distant past (e.g., child abuse, age of first gambling, etc.). However, one must be cautious here, as personality and intelligence are not totally immutable, and lifetime retrospective report of earlier events tends to be influenced by a person's current situation.

- When the independent variable primarily has its effect on the dependent variable at a young age and the cohort only contains older people. However, if, for this reason, the variable in year 1 is not statistically associated with the dependent variable in year 2, it is very unlikely that just going back one year to examine its influence within year 1 will be fruitful. The only real remedy for this situation is to ensure the cohort contains enough young people so that the impact of these types of 'early onset' variables can still be statistically observed. The other way of addressing this issue is to conduct subgroup analysis to examine whether certain etiologically important variables are age dependent.

- When most of the cohort has already developed the entity of interest in the first assessment, and there are very few new cases in subsequent years. However, in this situation there is very little value in doing a longitudinal study at all.

- When the variable has an immediate impact on the dependent variable, and quickly loses its impact in the subsequent year. While this may more legitimately warrant the examination of concurrent associations, it still does not resolve the problem of how to determine whether the association is due to correlation or causation. If this type of issue is suspected, then a finer-grained longitudinal chronology is needed (e.g, multiple assessments each year).

Coordinated Analysis of the QLS and LLLP Datasets

The generalizability of any one study is always limited to some extent by the sample characteristics and methodology of that study. An opportunity for enhancing the generalizability and scientific value of the QLS presented itself when a second large scale Canadian longitudinal study of gambling (i.e., the Leisure, Lifestyle, and Lifecycle Project (LLLP); el-Guebaly, Casey, Hodgins, Smith, Williams, Schopflocher & Wood, 2008; el-Guebaly, Casey, Currie, Hodgins, Schopflocher, Smith & Williams, 2015) was awarded to a team of Alberta researchers in 2006 that included 2 of the members of the QLS research team (i.e., Williams, Schopflocher). Partly as a consequence of this overlapping team membership, many of the important methodological features of these two projects were either identical or very similar.

Methodological Similarities and Differences

The similarities between the studies concern the fact that they both:
- Began in 2006 and ended in 2011.
- Had an exclusive (QLS) or primary (LLLP) focus on Canadian adults.
- Employed very large sample sizes (QLS = 4,121; LLLP = 1,372 adults + 436 adolescents), with overselection of people at risk for becoming problem gamblers (comprising 26% of the QLS sample and 29% of the LLLP sample).
- Conducted extremely comprehensive self-administered assessments of all variables of etiological relevance to gambling and problem gambling (no other longitudinal studies of gambling have employed assessments that are as comprehensive as the ones used in QLS and LLLP). For most constructs assessed, the actual questions and/or psychometric instruments were the same in both studies.
- Used identical or very similar questions to assess past year gambling behaviour (i.e., expenditure and frequency of participation on the same identified types of gambling).
- Used similar measures of problem gambling (the CPGI with a 5+ demarcation for problem gambling was used in both studies). (Note: the PPGM was still the primary instrument used in QLS).
- Had excellent (QLS = 93.9%) or very good (LLLP = 76.2% for the adult cohort) retention rates.
- Had a very similar and fairly stable level of legal gambling opportunities available during the study period.

There were a few important methodological differences between the studies:
- QLS had a smaller geographic area (70 kilometer radius around city of Belleville, Ontario), whereas LLLP recruited participants from 4 sites intended to approximate the demography of Alberta (cities of Calgary, Edmonton, Lethbridge, and Grande Prairie, as well as the rural areas surrounding Lethbridge ('rural south') and Grande Prairie ('rural north')).
- The LLLP only recruited people who were in one of 5 circumscribed age ranges (13-15; 18-20; 23-25; 43-45; 63-65), with an equal number of people in each age group, whereas all adults 18 and older were eligible to participate in the QLS. As a consequence, the average age of the QLS cohort (46.5) was older than the LLLP adult cohort (37.9).
- QLS had 5 assessments 12 months apart using a 5 month assessment window whereas LLLP had 4 assessments 17-22 months apart using a 9-10 month assessment window.
- Due to its larger sample size, the QLS cohort contained more problem gamblers (277 PPGM identified; with 236 completing all 5 assessments) compared to the LLLP adult cohort (94 CPGI 5+ identified; with 57 completing all 4 assessments).

A more detailed comparison of the methodological elements of the QLS versus the LLLP study is contained in Appendix D.

Analytic Similarities and Differences

Because of the large number of methodological similarities between QLS and LLLP, and because of the desire of both research teams to produce the most robust scientifically conclusions possible, a decision was made to use similar analytic approaches for both the QLS and LLLP datasets and to try and replicate findings in one dataset in the other dataset. Thus, the Results and Discussion sections of the present QLS Final Report (Williams et al., 2015) and the LLLP Final Report (el-Guebaly et al., 2015) are very similar in most respects. More specifically, the results and conclusions pertaining to the stability of gambling and problem gambling are identical (although the approaches differ somewhat). Furthermore, the approach, results, and conclusions regarding the univariate predictors and correlates of problem gambling are very similar. Where the 2 reports diverge are in the analyses predicting future problem gambling. QLS uses the presence or absence of problem gambling as the dependent variable and employs the PPGM for this determination, whereas LLLP uses the CPGI and analyzes changes in these scores. The QLS analyses also focus exclusively on predictors, whereas the LLLP analyses identify both predictors and correlates. The LLLP uses structural equation modeling and evaluates subsets of variables on gambling and problem gambling whereas the QLS uses logistic regression and evaluates all variables simultaneously in terms of their relationship to future problem gambling. Several other methodological differences exist. Nonetheless, the large majority of variables implicated in predicting future problem gambling in the QLS Final Report were also identified as important predictors in the LLLP Final Report. This is reflected in the fact that the final etiological model is identical in both studies.

RESULTS

Stability of Gambling and Problem Gambling

Stability of Non-Gambling, Recreational Gambling, and At Risk Gambling

Figure 4 depicts the stability of the PPGM **Non-Gambling** classification over the 5 QLS assessment periods for the 280 Non-Gamblers at Assessment 1 who subsequently completed all assessments (i.e., had no missing assessments). Each row represents an individual, with white designating Non-Gambling, green designating Recreational Gambling, yellow designating At Risk Gambling, and red designating Problem or Pathological Gambling. As can be seen, the slight majority of Non-Gamblers at Assessment 1 continue to be Non-Gamblers throughout the 5 years. However, it was also not uncommon for Non-Gamblers to transition into Recreational Gambling (roughly 27% of Non-Gamblers became Recreational Gamblers in Assessment 2; 15% in Assessment 3; 14% in Assessment 4; and 12% in Assessment 5). However, most Non-Gamblers who make this transition transitioned back into Non-Gambling in the next assessment. It was very uncommon for Non-Gamblers to directly transition into At Risk or Problem Gambling in the next assessment (occurring in 1% or less of the sample). Non-Gamblers at Assessment 1 also had the lowest risk of ever becoming Problem Gamblers, occurring in just 3/280 (1%) of individuals.

Figure 5 depicts the stability of the PPGM **Recreational Gambling** classification over the 5 QLS assessment periods for the 2,786 Recreational Gamblers at Assessment 1 who subsequently completed all assessments. Each row represents 25 individuals, with green designating Recreational Gambling. This figure illustrates that the large majority (70%) of Recreational gamblers at Assessment 1 continued to be Recreational gamblers throughout the study, although a small percentage eventually transitioned into Non-Gambling (13%) or At Risk Gambling (10%). Only 5% of Recreational Gamblers in Assessment 1 became Problem Gamblers at some point in the subsequent 4 years.

Figure 6 illustrates the stability of the PPGM **At Risk Gambling** classification over the 5 QLS assessment periods for the 481 At Risk individuals at Assessment 1 who completed all subsequent assessments. Each row represents an individual, with yellow designating At Risk Gambling. As can be seen, this category displays considerably more instability compared to the Non-Gambling and Recreational Gambling categories. Only a minority of At Risk individuals continued in this category in the next assessment period (37% from Assessment 1 remained in this category in Assessment 2) and only 6.7% of individuals were in the At Risk category in all 5 years. It is also important to note that although a small but significant percentage of At Risk Gamblers subsequently become Problem Gamblers (71/482 = 14.7%), a much more common route was transitioning back to Recreational Gambling.

Figure 4. Stability of PPGM Non-Gambling over Time in QLS (*n* = 280).

Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5

Figure 5. Stability of PPGM Recreational Gambling over Time in QLS (*n* = 2,786).

Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5

Figure 6. Stability of PPGM At Risk Gambling over Time in QLS (*n* = 481).

| Assessment 1 | Assessment 2 | Assessment 3 | Assessment 4 | Assessment 5 |

Stability of Problem and Pathological Gambling

Taking Measurement Error into Account

Unlike many clinical entities (e.g., diabetes, cancer) there is no objective test for problem gambling. Rather, its assessment is largely based on a person's self-reported perception of their behavior and mental state over the past year. However, the accuracy of this perception is compromised by incomplete recall, recency bias, self-deception, mood state, social desirability, the short period of time participants are given to answer the questions, and genuine uncertainty about whether they meet the criteria being asked about.

The one month test-retest reliability of the PPGM and CPGI provides some indication of the magnitude of "measurement error" involved. Because both instruments ask about behaviour in the past 12 months, there should be very little difference in self-report with the passage of 4 weeks. However, as seen in Table 10 below, considerable one month variability exists.

Table 10. One Month Test-Retest Reliability of the PPGM and CPGI.

PPGM Problems Subscore	$r = .75$	Canada in 2006/7; n = 328; Williams & Wood, 2007
PPGM Impaired Control Subscore	$r = .72$	Canada in 2006/7; n = 328; Williams & Wood, 2007
PPGM Other Subscore	$r = .69$	Canada in 2006/7; n = 328; Williams & Wood, 2007
PPGM Total Score	$r = .78$	Canada in 2006/7; n = 328; Williams & Wood, 2007
PPGM Categories (5)	$r = .68$	Canada in 2006/7; n = 328; Williams & Wood, 2007
PPGM PG or non-PG	$V = .70$	Canada in 2006/7; n = 328; Williams & Wood, 2007
CPGI Total Score	$r = .78$	Canada in 2001; n = 417; Ferris & Wynne, 2001
	$r = .75$	Canada in 2006/7; n = 328; Williams & Wood, 2007
CPGI Traditional 5 Categories	$r = .61$	Canada in 2006/7; n = 328; Williams & Wood, 2007
CPGI 5+ versus 0 – 4	$V = .54$	Canada in 2006/7; n = 328; Williams & Wood, 2007

In recognition of the measurement error inherent in self-report instruments, the Reliable Change Index (RCI) was developed by Jacobson & Truaxx (1991) to detect genuine differences in scores above and beyond the natural variation in scores that are simply reflective of measurement error at each time point.

The size of the difference between 2 scores that is needed to represent statistically significant change at $p < .05$ level (i.e., the RCI) is a function of the test-retest reliability (r_{xx}) of the instrument and the standard deviation (SD) of test scores. The specific formula is as follows:

$$RCI = \frac{x_1 - x_2}{\sqrt{2(SD_1\sqrt{1 - r_{xx}})^2}}$$

Table 11 shows the calculated RCI for the PPGM and the CPGI that will be used in the present analyses. (Note that because of the more complicated scoring system of the PPGM, subscore RCIs also have to be determined).

Table 11. Reliable Change Index for the PPGM and the CPGI.

	Standard Deviation	Test-Retest Reliability	Reliable Change Index
PPGM Problems Subscore	.48	.75	1
PPGM Impaired Control Subscore	.41	.72	1
PPGM Other Subscore	.33	.69	1
PPGM Total Score	1.03	.78	2
CPGI Total Score	1.86	.765	3

Table 12 provides examples of the application of the RCI for the CPGI (which is easier to illustrate than the PPGM), using a CPGI score of 5 - 27 as denoting Problem Gambling (PG), and scores between 0 and 4 representing Non-Problem Gambling (Non-PG). Using the RCI, category designation not only requires the person's score to be in the appropriate range, but a change in category designation from one time period to the next requires a score change of 3 or more.

In the first example, at the top, the change in category designation from one assessment to the next is always associated with a score change of 3 or more, and therefore no RCI correction is required. In the second example, even though the score of 4 in Assessment 3 is technically in the Non-PG range, because the change in score from Assessment 2 does not represent a decrease of 3 or more points, the person retains the same PG designation they had in Assessment 2. The third example shows the one exception where the RCI rule can be over-ridden, where category stability in 2 or more consecutive time periods overrides the need for a change in score of 3 or more. In this instance the fact that the person continues to be in the Non-PG category in Assessment 4 provides reassurance that the change in category designation from Assessment 2 to Assessment 3 is real, and overrides the need for a change score of 3 or more for the person to be designated as a Non-PG in Assessment 3.

Table 12. Illustration of the Application of the Reliable Change Index for the CPGI.

		Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5
1	CPGI Score	0	8	5	2	5
	PG Status	Non-PG	PG	PG	Non-PG	PG
2	CPGI Score	5	6	4	7	2
	PG Status	PG	PG	PG	PG	Non-PG
3	CPGI Score	5	6	4	3	2
	PG Status	PG	PG	Non-PG	Non-PG	Non-PG

Application of the RCI in the QLS resulted in 0.6% (7/1180) of the PPGM problem gambling designations being changed and 7.0% (79/1130) of the CPGI 5+ problem gambling designations being changed. In the LLLP, application of the RCI resulted in 5.6% (16/285) of the CPGI 5+ problem gambling designations being changed.

Problem Gambling Stability

Figure 7 illustrates the stability of problem gambling in the 5 assessment periods of the QLS using a problem or pathological designation on the PPGM to designate problem gambling, any other score to designate non-problem gambling, and requiring the requisite RCI change for problem gambling to change to non-problem gambling and non-problem gambling to change to problem gambling. The figure is restricted to the 236 individuals who were problem or pathological gamblers on the PPGM at any point during the QLS study and completed all 5 assessments. Each row represents an individual, with red designating problem/pathological gambling and white designating non-problem gambling (a group which includes Non-Gamblers, Recreational gamblers, and At Risk gamblers). [20] In addition to the 236 people who were PPGM problem/pathological gamblers at some point during the study and completed all 5

---

[20] This figure also illustrates that the prevalence of problem gambling decreased over time in the QLS (as it also did in the LLLP) (QLS: 3.1% in Assessment 1; 2.9% in Assessment 2; 2.6% in Assessment 3; 2.7% in Assessment 4; 2.0% in Assessment 5). This decrease was primarily related to fewer new cases of problem gambling each year (i.e., decreased incidence). In QLS, the percentage of problem gamblers that represented 'new' problem gamblers was 49% in Assessment 2; 40% in Assessment 3; 28% in Assessment 4; and 16% in Assessment 5. The decrease in prevalence observed in this study is consistent with the decreasing worldwide prevalence of problem gambling that has occurred in the past 15 years (Williams, Volberg & Stevens, 2012). In Alberta it may have been further accelerated by the Jan 1, 2008 smoking ban that applied to all non-Native casinos (the Ontario smoking ban occurred prior to the start of the QLS). There may also be some artifactual contributions to the decreased prevalence observed in the present study. Whenever a study initially overselects for people with an unstable condition (such as problem gambling) then the highest prevalence rate will normally be observed in the first year, decreasing thereafter. This decrease may be augmented by the fact that most of the problem gamblers in these samples had not received treatment, and our scrutiny of their behaviour and their problem gambling symptomatology could potentially serve as a type of first time intervention for many of them (Only 8.2% of QLS PPGM Problem Gamblers in Assessment 1 had sought help for their gambling problems).

assessments, there were 41 people who were problem/pathological gamblers at some point but missed one or more assessment periods. The RCI stability pattern of problem gambling for these individuals is contained in Appendix E.

For comparison purposes, Figure 8 illustrates the stability of problem gambling in the 5 assessment periods of the QLS using a score of 5 or more on the CPGI to designate problem gambling and any other score to designate non-problem gambling, and requiring the requisite RCI change (3 points) for problem gambling to change to non-problem gambling and non-problem gambling to change to problem gambling. This figure is restricted to the 226 individuals who scored 5 or higher on the CPGI at any point during the study and completed all 5 assessments. Here again, each row represents an individual, with red colouring designating problem gambling and white designating non-problem gambling (a group which includes non-gamblers, recreational gamblers, and at risk gamblers). In addition to the 226 people who were CPGI 5+ problem gamblers at some point during the study and completed all 5 assessments, there were 44 people who were CPGI 5+ problem gamblers at some point but missed one or more assessment periods. The RCI stability pattern of these individuals is contained in Appendix E.

Figure 9 illustrates the stability of problem gambling in the 4 assessment periods of the LLLP using a score of 5 or more on the CPGI to designate problem gambling and any other score to designate non-problem gambling, and requiring the requisite RCI change (3 points) for problem gambling status to change to non-problem gambling and non-problem gambling status to change to problem gambling. This figure is restricted to the 57 individuals who scored 5 or higher on the CPGI at any point during the study and completed all 4 assessments. In addition to the 57 people who scored as CPGI 5+ problem gamblers at some point during the LLLP study and completed all 4 assessments, there were 37 people who scored as CPGI 5+ problem gamblers at some point but missed one or more assessments. The stability pattern of problem gambling for these individuals is contained in Appendix E.

Table 13 provides a quantification of the results from the 3 figures.

Figure 7. Stability of PPGM Problem/Pathological Gambling in the QLS over Time (*n* = 236).

Each row represents an individual, with red designating problem/pathological gambling and white designating non-problem gambling.

Figure 8. Stability of CPGI 5+ Problem Gambling in the QLS over Time (n = 226).

Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5

Each row represents an individual, with red designating problem/pathological gambling and white designating non-problem gambling.

Figure 9. Stability of CPGI 5+ Problem Gambling in the LLLP over Time (*n* = 57).

Assessment 1	Assessment 2	Assessment 3	Assessment 4

Each row represents an individual, with red designating problem/pathological gambling and white designating non-problem gambling.

Table 13. Problem Gambling (PG) Stability across Instruments (PPGM versus CPGI 5+) and Studies (QLS versus LLLP).

	QLS PPGM		QLS CPGI 5+		LLLP CPGI 5+	
	n/N	%	n/N	%	n/N	%
PGs who are PGs in 1 time period	120/236	**50.8%**	105/226	**46.5%**	27/57	**47.4%**
PGs who are PGs in 2 time periods	53/236	**22.5%**	43/226	**19.0%**	9/57	**15.8%**
PGs who are PGs in 3 time periods	23/236	**9.7%**	24/226	**10.6%**	11/57	**19.3%**
PGs who are PGs in 4 time periods	21/236	**8.9%**	23/226	**10.2%**	10/57	**17.5%**
PGs who are PGs in 2 or more consecutive years	88/236	**37.3%**	109/226	**48.2%**	27/57	**47.4%**
PGs who are PGs in exactly 2 consecutive years	41/236	**17.4%**	44/226	**19.5%**	10/57	**17.5%**
PGs who are PGs in exactly 3 consecutive years	15/236	**6.4%**	22/226	**9.7%**	7/57	**12.3%**
PGs who are PGs in exactly 4 consecutive years	13/236	**5.5%**	12/226	**5.3%**	10/57	**17.5%**
PGs who are PGs in all 5 consecutive years	19/236	**8.1%**	31/226	**13.7%**	--	--
PGs who have at least 1 year of recovery	191/225	**84.9%**	166/213	**77.9%**	33/50	**66.0%**
After exactly 2 consecutive years PG, % who recover in the next year	31/78	**39.7%**	32/97	**31.6%**	7/24	**29.2%**
After exactly 3 consecutive years PG, % who recover in the next year	8/40	**20.0%**	12/55	**21.8%**	1/11	**9.1%**
After exactly 4 consecutive years PG, % who recover in the next year	8/27	**29.6%**	8/40	**20.0%**	--	--
After recovery from PG, % who relapse in the year following the recovery year	47/161	**29.2%**	25/143	**17.5%**	7/24	**29.2%**
After recovery from PG, % who relapse within 2 years following the recovery year	38/109	**34.9%**	24/110	**21.8%**	3/9	**33.3%**
After recovery from PG, % who relapse within 3 years following the recovery year	24/58	**41.4%**	19/68	**28.0%**	--	--
4 alternating PG to non-PG status's within 4 years	21/236	**8.9%**	10/226	**4.4%**	3/57	**5.3%**
4 alternating PG to non-PG status's within 5 years	32/236	**13.6%**	16/226	**7.1%**	--	--

Note 1. In QLS Assessment 1 there were a 109 people who reported a possible or certain lifetime history of problem gambling beyond the past year. If lifetime history of PG is added as an additional time period then the % of PPGM PGs who are PGs in various time periods becomes: 44.9% for 1, 27.5% for 2, 9.7% for 3, 6.8% for 4, 9.3% for 5, and 1.7% for 6 time periods. When using the CPGI 5+ the figures become 41.6% for 1, 21.7% for 2, 9.7% for 3, 10.6% for 4, 14.6% for 5, and 1.8% for 6 time periods.

Note 2. In determining recovery and relapse rates, people are excluded from the denominator when there is insufficient number of subsequent assessments to evaluate what is being calculated.

Pathological Gambling Stability

It is possible that more severe forms of problem gambling might exhibit a different pattern of stability compared to less severe forms. Consequently, the following analyses focus on individuals who scored in the pathological gambling range on the PPGM and the severe problem gambling range on the CPGI (i.e., 8+) at any point during the studies. There are 2 ways to examine the stability of pathological gambling. One is the stability of the pathological gambling designation itself. Another is the stability of disordered gambling (i.e., *either* problem or pathological gambling) among individuals who have received a pathological gambling designation at some point. Both questions have merit, so both analyses were conducted.

Figure 10 illustrates the stability of disordered gambling (pathological and problem gambling) in the 5 assessment periods of the QLS among individuals who received a PPGM pathological gambling designation at any point during the study. As before, the requisite RCI change is applied for category change (i.e., pathological, problem, or non-problem). Each row represents an individual, with dark red designating pathological gambling, red designating problem gambling, and white designating non-problem gambling (a group which includes non-gamblers, recreational gamblers, and at risk gamblers). This figure is restricted to the 88 individuals who were pathological gamblers on the PPGM at any point during the study and completed all 5 assessments. In addition to the 88 people who were PPGM pathological gamblers at some point during the study and completed all 5 assessments, there were 14 people who were pathological gamblers at some point but missed one or more assessment periods. The stability pattern of disordered gambling for these individuals is contained in Appendix E.

Figure 11 illustrates the stability of disordered gambling (problem or severe problem) in the 5 assessment periods of the QLS using a score of 8 or more on the CPGI to designate severe problem gambling (analogous to pathological gambling), a score of 5 to 7 designating problem gambling, and any other score to designate non-problem gambling. The requisite RCI change of 3 or more points is again required for category change. This figure is restricted to the 84 individuals who scored 8 or higher on the CPGI at any point during the study and completed all 5 assessments. In addition to the 84 people who were CPGI 8+ severe problem gamblers at some point during the study and completed all 5 assessments, there were 21 people who were severe problem gamblers at some point but missed one or more assessment periods. The stability pattern of disordered gambling for these individuals is displayed in Appendix E.

Figure 12 illustrates the stability of disordered gambling (problem or severe problem) in the 4 assessment periods of the LLLP using a score of 8 or more on the CPGI to designate severe problem gambling, a score of 5 to 7 designating problem gambling, and any other score to designate non-problem gambling. The requisite RCI change of 3 or more points is again required for category change. This figure is restricted to just the 21 individuals who scored 8 or higher on the CPGI at any point during the study and completed all 4 assessments. In addition to the 21 people who were CPGI 8+ pathological gamblers at some point during the study and completed all 4 assessments, there were 13 people who were severe problem gamblers at

some point but missed one or more assessments. The stability pattern of disordered gambling for these individuals is displayed in Appendix E.

Table 14 provides a quantification of these 3 figures in terms of the stability of the pathological gambling designation. Table 15 provides a quantification of these 3 figures in terms of the stability of disordered gambling (either problem or pathological).

Figure 10. Stability of PPGM Pathological Gambling in the QLS over Time (*n* = 88).

Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5

Each row represents an individual, with dark red designating pathological gambling, red designating problem gambling, and white designating non-problem and non-pathological gambling.

Figure 11. Stability of CPGI 8+ Severe Problem Gambling in the QLS over Time (*n* = 84).

Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5

Each row represents an individual, with dark red designating pathological gambling, red designating problem gambling, and white designating non-problem and non-pathological gambling.

Figure 12. Stability of CPGI 8+ Severe Problem Gambling in the LLLP over Time (*n* = 21).

Assessment 1	Assessment 2	Assessment 3	Assessment 4

Each row represents an individual, with dark red designating pathological gambling, red designating problem gambling, and white designating non-problem and non-pathological gambling.

Table 14. Stability of Pathological Gambling (PPG) across Instruments (PPGM versus CPGI 8+) and Studies (QLS versus LLLP).

	QLS PPGM		QLS CPGI 8+		LLLP CPGI 8+	
	n/N	%	n/N	%	n/N	%
PPGs who are PPGs in 1 time period	46/88	**52.3%**	43/84	**51.2%**	11/21	**52.4%**
PPGs who are PPGs in 2 time periods	16/88	**18.2%**	12/84	**14.3%**	3/21	**14.3%**
PPGs who are PPGs in 3 time periods	9/88	**10.2%**	8/84	**9.5%**	2/21	**9.5%**
PPGs who are PPGs in 4 time periods	9/88	**10.2%**	10/84	**11.9%**	5/21	**23.8%**
PPGs who are PPGs in 2 or more consecutive years	34/88	**38.6%**	37/84	**44.0%**	10/21	**47.6%**
PPGs who are PPGs in exactly 2 consecutive years	15/88	**17.1%**	12/84	**14.3%**	3/21	**14.3%**
PPGs who are PPGs in exactly 3 consecutive years	5/88	**5.7%**	8/84	**9.5%**	2/21	**9.5%**
PPGs who are PPGs in exactly 4 consecutive years	6/88	**6.8%**	6/84	**7.1%**	5/21	**23.8%**
PPGs who are PPGs in all 5 consecutive years	8/88	**9.1%**	11/84	**13.1%**	--	--
PPGs who have at least 1 year of remission from PPG	68/84	**81.0%**	60/78	**76.9%**	10/17	**58.8%**
After exactly 2 consecutive years PPG, % who remit from PPG in the next year	9/27	**33.3%**	7/32	**22.6%**	3/10	**30.0%**
After exactly 3 consecutive years PPG, % who remit from PPG in the next year	2/16	**12.5%**	2/19	**10.5%**	1/6	**16.7%**
After exactly 4 consecutive years PPG, % who remit from PPG in the next year	4/12	**33.3%**	3/14	**21.4%**	--	--
After recovery from PPG, % who relapse to PPG in the year following the recovery year	11/54	**20.4%**	6/50	**12.0%**	0/7	**0%**
After recovery from PPG, % who relapse to PPG within 2 years following the recovery year	13/48	**27.1%**	8/43	**18.6%**	0/1	**0%**
After recovery from PPG, % who relapse to PPG within 3 years following the recovery year	5/22	**22.3%**	8/24	**33.3%**	--	--
4 alternating PG to non-PG status's within 4 years	6/88	**6.8%**	2/84	**2.4%**	0/21	**0%**
4 alternating PG to non-PG status's within 5 years	10/88	**11.4%**	3/84	**3.4%**	--	--

Note 1. In determining recovery and relapse rates, people are excluded from the denominator when there is insufficient number of subsequent assessments to evaluate what is being calculated.

Table 15. Stability of Disordered Gambling (problem or pathological) among Participants Receiving a Designation of Pathological Gambling (PPG) at Some Point during the Study across Instruments (PPGM versus CPGI8+) and Studies (QLS versus LLLP).

	QLS PPGM		QLS CPGI 8+		LLLP CPGI 8+	
	n/N	%	n/N	%	n/N	%
PPGs who are PG or PPGs in 1 time period	24/88	**27.3%**	22/84	**26.2%**	6/21	**28.6%**
PPGs who are PG or PPGs in 2 time periods	19/88	**21.6%**	15/84	**17.9%**	1/21	**4.8%**
PPGs who are PG or PPGs in 3 time periods	13/88	**14.8%**	10/84	**11.9%**	7/21	**33.3%**
PPGs who are PG or PPGs in 4 time periods	16/88	**18.2%**	15/84	**17.9%**	7/21	**33.3%**
PPGs who are PG or PPGs in 2 or more consecutive years	56/88	**63.6%**	59/84	**70.2%**	14/21	**66.7%**
PPGs who are PG or PPGs in exactly 2 consecutive years	19/88	**21.6%**	19/84	**22.6%**	2/21	**9.5%**
PPGs who are PG or PPGs in exactly 3 consecutive years	11/88	**6.1%**	11/84	**13.1%**	5/21	**23.8%**
PPGs who are PG or PPGs in exactly 4 consecutive years	10/88	**11.4%**	7/84	**8.3%**	7/21	**33.3%**
PPGs who are PG or PPGs in all 5 consecutive years	16/88	**18.2%**	22/84	**26.2%**	--	--
PPGs who have at least 1 year of recovery from PG or PPG	60/87	**69.0%**	50/81	**61.7%**	8/19	**42.1%**
After exactly 2 consecutive years PG or PPG, % who recover in the next year	13/50	**26.0%**	16/56	**28.6%**	2/15	**13.3%**
After exactly 3 consecutive years PG or PPG, % who recover in the next year	4/31	**12.9%**	3/33	**9.1%**	2/9	**22.2%**
After exactly 4 consecutive years PG or PPG, % who recover in the next year	5/21	**23.8%**	5/29	**17.2%**	--	--
After recovery from PG or PPG, % who relapse in the year following the recovery year	13/48	**27.1%**	12/42	**28.6%**	1/4	**25.0%**
After recovery from PG or PPG, % who relapse within 2 years following the recovery year	16/38	**42.1%**	13/33	**39.4%**	0/1	**0%**
After recovery from PG or PPG, % who relapse within 3 years following the recovery year	11/18	**61.1%**	8/16	**50.0%**	--	--
4 alternating PG or PPG to non-PG status's within 4 years	6/88	**6.8%**	2/84	**2.4%**	0/21	**0%**
4 alternating PG or PPG to non-PG status's within 5 years	7/88	**8.0%**	5/84	**6.0%**	--	--

Note 1. In QLS Assessment 1 there were a 109 people who reported a possible or certain lifetime history of problem gambling beyond the past year. If lifetime history of PG is added as an additional time period then the % of people who have PPGM PG or PPG in various time periods becomes: 44.9% for 1, 27.5% for 2, 9.7% for 3, 6.8% for 4, 9.3% for 5, and 1.7% for 6 time periods. When using the CPGI the figures become 41.6% for 1, 21.7% for 2, 9.7% for 3, 10.6% for 4, 14.6% for 5, and 1.8% for 6 time periods.

Note 2. In determining recovery and relapse rates, people are excluded from the denominator when there is insufficient number of subsequent assessments to evaluate what is being calculated.

Consistency across Instruments and Datasets

The pattern of results is fairly similar for both the PPGM and the CPGI within the QLS, despite conceptual differences in how the instruments were created and how problem gambling designation is determined. However, there is a tendency for chronicity to be slightly higher with the CPGI, and for both recovery rates and relapse rates to be slightly lower.

There is also reasonable consistency in the main findings across the two datasets (QLS and LLLP), although chronicity is somewhat higher in LLLP compared to QLS, as seen in a higher portion of problem gamblers who are problem gamblers in 3 or 4 assessment periods (consecutive or otherwise) and lower portions of people who recover. However, this greater chronicity may be due to the pattern of missing assessments in LLLP. As seen in Appendix E, in LLLP there were 37 individuals who were CPGI 5+ problem gamblers at some point but did not complete all 4 assessments, leaving only 57 individuals to be displayed and quantified in the tables. Twenty-six of these 37 people were problem gamblers in only *one* identified time period. If we assume these 26 individuals had the same high rate of recovery and relatively low rate of chronicity as other individuals identified as problem gamblers in a single time period, then the proportion of problem gamblers being problem gamblers in 3 or more time periods (consecutive or otherwise), decreases to rates more similar to what was found in QLS.

The QLS results are also slightly more 'chronic' then they should be for the same reason. The QLS has 42 PPGM problem gamblers missing one or more assessments, leaving 236 to be displayed and quantified in the tables. Similar to LLLP, the large majority of these individuals were problem gamblers in only a single time period (31/42) and so would also be expected to have higher levels of recovery and lower levels of chronicity. However, the impact of these missing cases on the QLS results is much less (i.e., 31 relative to 236 is a much smaller ratio than the 26 relative to 57 in LLLP).

Univariate Correlates of Problem Gambling in QLS and LLLP

As indicated earlier, the etiological meaning of significant group differences that occur in the same time period ('correlates') is often unclear. Nonetheless, in the interests of comprehensiveness, Appendix F documents the average values for each of the QLS independent variables in each assessment as a function of whether the person was in the PPGM Non-Gambler, Non-Problem Gambler (Recreational and At Risk Gamblers combined), or Problem Gambler category (Problem and Pathological Gamblers combined) *in that same time period*. The sample for each independent variable only includes people whom the variable pertains to (e.g., job stress just calculated for employed people; marital status just calculated for married people; gambling motivation and context not calculated for non-gamblers, etc.). The figures presented represent percentages in the case of categorical variables and means and standard deviations (in brackets) in the case of continuous variables. When variable information was not collected during a particular time period it is denoted by '—'.

In addition to the values for each assessment period, *average values across the assessments* are also presented. These averages were created by weighting each year's data as a function of sample size (e.g., the number of Non-Gamblers in each assessment period is 309 in Assessment 1, 298 in Assessment 2, 363 in Assessment 3, 423 in Assessment 4, and 406 in Assessment 5, for a total of 1799; hence, Assessment 1 data received a weight of 309/1799 toward the average profile for Non-Gamblers). When data was not available for all assessments the weighting was adjusted accordingly. In order to gauge whether there were meaningful differences between the groups, these average values were then subject to statistical testing. A z test of proportions was applied to categorical variables to determine whether the average proportion for the Non-Problem Gambler group differed significantly from the average proportion for the Problem Gambler group. An independent group t-test was used in an analogous manner for the continuous variables. Significant differences between the 2 groups are denoted by blue shading.[21]

Appendix G documents the average values for each of the LLLP independent variables in each assessment as a function of whether the person was in the Non-Gambler, Non-Problem Gambler (CPGI 0 – 4)[22] or Problem Gambler (CPGI 5+) category in that same time period. As was the case for QLS, the sample for each independent variable only includes people whom the variable pertains to; the figures presented represent percentages in the case of categorical variables and means and standard deviations (in brackets) in the case of continuous variables; and when variable information was not collected during a particular time period it is denoted by '—'.

---

[21] Because there is some degree of movement between gambling category membership over time, the *averaged groups* are not totally independent (a requirement of these statistical tests). Thus, statistical significance must be regarded with some caution.

[22] For this analysis the CPGI groups of Non-Problem Gambler (CPGI = 0) and At Risk Gambler (CPGI = 1-4) have been combined into a single group.

In addition to the values for each assessment period, average values across the assessments are also presented. Here again, these averages were created by weighting each year's data as a function of sample size and a z test of proportions was then applied to the categorical variables and a t-test applied to the continuous variables to gauge whether the average value for the Non-Problem Gambler group differed significantly from the Problem Gambler group. Significant differences between the groups are denoted by purple shading.

A summary of the significant univariate correlates of problem gambling for both QLS and LLLP is presented in Table 16 below. (Questions that were assessed differently between the two studies are noted beside the variable. For example, 'early big win' was assessed as 'big win prior to 19' in QLS, but 'big win when first started gambling' in LLLP). It should also be noted that the number of statistically significant results and whether it is significant at the $p < .05$ or $p < .01$ level is partly a function of the size of the 'Problem Gambler (PG)' group, which is larger in QLS ($n = 107$) than LLLP ($n = 42$).

With a few important exceptions (i.e., gender, income, gambling at an early age) all of the correlates of problem gambling identified in prior research (listed in the Introduction) were also were identified as correlates in the present results. In addition to these well-established correlates, there were several new correlates of problem gambling identified that prior research has not investigated to any great extent. These were: more time spent gambling; membership in a gambling rewards program; greater endorsement of money and/or power being 'the most important thing in life'; *lower* endorsement of the statement 'wealth indicates success'; the presence of certain mental health problems/disorders (psychosomatic complaints, paranoid ideation, borderline features, aggressive propensity, obsessive compulsive disorder; attention-deficit hyperactivity); behavioural addiction; lower rating of community quality and involvement; gambling as a favoured leisure activity; and lower intelligence.

Table 16. Univariate Correlates of Concurrent Problem Gambling in QLS and LLLP.

Legend: *p < .05 (2 tail)* [light blue]; *p < .01 (2 tail)* [blue]; *p < .05 (2 tail)* [light purple]; *p < .01 (2 tail)* [purple]

	QLS Correlates	LLLP Correlates
DEMOGRAPHICS		
Male		
Younger Age		p<.05
Immigrant		
Non-Caucasian	p<.01	p<.05
Adopted		
Lower Educational Attainment	p<.05	
Marital Status (separated or not married)	p<.01	
Employment Status (on leave or on strike)	p<.01	
Household Income		
Household Debt		
Geographical Location	--	
PHYSICAL HEALTH		
Physical disability		p<.05
Lower physical health rating	p<.01	p<.01
Taking prescription medication		
GAMBLING		
Gambling Attitudes (less positive)	p<.01	
LIFETIME GAMBLING		
Age first gambled		
Frequency of gambling prior to 19		--
Big win prior to 19 (QLS); Big win when 1st started gambling (LLLP)		p<.01
Big loss prior to 19 (QLS); Big loss when 1st started gambling (LLLP)		p<.01
Big win and big loss prior to 19	p<.01	--
Parents or sibs regular gamblers when person growing up (QLS); Parents or sibs do/did gamble regularly (LLLP)	p<.05	p<.01
Parents or sibs gambled with person when growing up (QLS); (parents only in LLLP)	p<.05	p<.05
Parents or sibs problem gamblers when person growing up (QLS); Parents or sibs are/were problem gamblers (LLLP)	p<.01	p<.01
Largest single day loss ever	p<.01	
Largest single day win ever		--
Lifetime net win/loss	p<.01	--
PAST YEAR GAMBLING		
Lottery ticket frequency	p<.01	p<.01
Raffle ticket frequency	--	
Instant win ticket frequency	p<.01	p<.01
Bingo frequency	p<.01	p<.01
EGM frequency	p<.01	p<.01
Casino table game frequency	p<.01	p<.01
Social games of skill frequency (QLS); Private games for $ frequency (LLLP)	p<.01	p<.01
Sports betting frequency	p<.01	p<.01
Horse or dog racing frequency	p<.01	p<.01
High risk stock frequency	p<.01	
Out-of-province casino frequency	--	
FREQUENCY OF ALL FORMS COMBINED	p<.01	p<.01
Gambled on Internet	p<.01	p<.05
TOTAL NUMBER OF GAMBLING TYPES ENGAGED IN	p<.01	p<.01
Lottery ticket expenditure	p<.01	
Raffle ticket expenditure	--	
Instant win ticket expenditure	p<.01	p<.05
Bingo expenditure	p<.01	p<.05
EGM expenditure	p<.01	p<.01
Casino table game expenditure	p<.01	
Social games of skill expenditure	p<.01	
Sports betting expenditure	p<.01	p<.01

		QLS Correlates	LLLP Correlates
p < .05 (2 tail);	*p < .01 (2 tail); p < .05 (2 tail); p < .01 (2 tail)*		
	Horse or dog racing expenditure		
	High risk stock expenditure		
	Out-of-province casino expenditure	--	
	EXPENDITURE ON ALL TYPES COMBINED (category)		
	Largest single day loss (category)		--
	Largest single day win (category)		--
	TOTAL TIME SPENT GAMBLING	--	
	Membership in gambling rewards program		--
	Higher frequency of ATM use in gambling venues		--
GAMBLING MOTIVATION	Excitement/entertainment/fun		
	To win money		
	Escape/distraction (QLS); dissociation while gambling (LLLP)		
	To socialize		
	To support worthy causes		--
	To feel good about self		--
	Other motivation		--
GAMBLING CONTEXT (past year)	Gambling alone rather than with friends		--
	Drink alcohol when gambling (QLS); Alcohol/drugs when gambling (LLLP)		
	Use tobacco when gambling		--
	Use [street] drugs when gambling (QLS); Alcohol/drugs when gambling (LLLP)		
GAMBLING SOCIAL EXPOSURE	# close friends/family regular gamblers (friends only in LLLP)		
	# of close friends and family with gambling problems		--
	Other adults in household with gambling problems		--
GAMBLING EXPOSURE	Opportunities to gamble at workplace or school		
	Had prevention/awareness campaign at work or school		--
	Gambling Fallacies		
GAMBLING AVAILABILITY	Driving time (minutes) to nearest EGM venue		--
	Distance (km) to nearest EGM venue		
	Participant estimate of distance to nearest EGM venue		--
	Casino/racino density	--	
PERSONALITY			
	Neuroticism (higher)		
	Depression (higher)		
	Vulnerability (higher)		
	Impulsivity (higher)		
	Extraversion		
	Excitement-seeking (higher)		
	Openness		
	Agreeableness (lower)		
	Conscientiousness (lower)		
STRESS			
	Number of stressful life events in past year		
WELL BEING	Stress level (higher)		
	Happiness level (lower)		
	Life satisfaction (lower)		
	Personal Wellness Index (lower)		
	Abused as a child		
	Other past trauma that still impacts today		--
VALUES			
Most important in life	Money (higher)		--
	Power (higher)		--
	Fame		--
	Friendships (lower)		--
	None of the above		--
	Wealth indicates success (lower)		--

			QLS Correlates	LLLP Correlates
p < .05 (2 tail);	*p < .01 (2 tail);*	*p < .05 (2 tail);* *p < .01 (2 tail)*		
MENTAL HEALTH				
MENTAL DISORDERS		Post-Traumatic Stress		--
		Major Depressive Disorder		
		Suicidal Ideation	--	
		Mania		
		Generalized Anxiety Disorder		
		Panic Attacks &/or Agoraphobia		
		Social Phobia	--	
		Specific Phobias	--	
		Somatic Complaints	--	
		Paranoia	--	
		Borderline Features	--	
		Aggression	--	
		Obsessive Compulsive Disorder		
		Eating Disorder		
		Schizophrenic or Delusional Disorder		
		Attention Deficit Hyperactivity	--	
		ANY MENTAL HEALTH PROBLEM		--
SUBSTANCE USE, ABUSE, AND DEPENDENCE		Tobacco user		
		Alcohol use (QLS); Level of alcohol use (LLLP)		
		Illicit Drug use		
		≥ Weekly use of tobacco, alcohol, illicit drugs or nonmedical use of licit drugs		--
		Substance abuse or dependence (QLS); drug dependence (LLLP)		
LIFETIME MENTAL HEALTH (prior to past 12 months)		Behavioural Addiction		--
		Lifetime history of addiction to drugs/alcohol		--
		Lifetime history of behavioural addiction		--
		Parents/siblings have history of addiction		--
		Lifetime history of mental health problems		--
		Parents/siblings have history of mental health problems		--
SOCIAL FUNCTIONING				
		Heterosexual		
SOCIAL FUNCTIONING AND SUPPORT		Marital Satisfaction (lower)		
		Social Support (lower)		
		Family functioning (lower)		
		Community quality & involvement (lower)		
RELIGION		Religious Affiliation		
		Religiosity		
RECREATIONAL ACTIVITIES		Gambling is 1 of 5 favourite leisure activities		--
		Gambling is favourite leisure activity		--
OCCUPATIONAL FUNCTIONING		Job stress (higher)		--
		Job satisfaction		--
ILLEGAL BEHAVIOUR AND ANTISOCIALITY		Number of Illegal activities in lifetime		
		Number of Illegal activities in past year		--
		Antisociality		
COGNITIVE FUNCTIONING				
		Lower Intelligence		
		Wisconsin Card Sorting Test (fewer errors)	--	

Prediction of Future Problem Gambling

Methodological and Statistical Approach

The basic methodological approach used in the present analysis is *examining how variation in levels of independent variables between individuals relates to the subsequent appearance or non-appearance of problem gambling*. There are other approaches that could be taken. Another option would be to examine change in independent variable scores from one assessment to the next as they relate to problem gambling status in the second assessment. However, this is still a correlational analysis that says nothing about whether the increase in the level of an independent variable (e.g., depression) in the second assessment is a cause or a result of the problem gambling status observed in the prior assessment. Another option would be to examine change in independent variable scores from Assessment 1 to Assessment 2 as they relate to change in problem gambling status from Assessment 2 to Assessment 3. The main problem with this approach is that many variables do not change over time (e.g., demographic characteristics, intelligence). Consequently, these variables could not be used in the same multivariate analysis to establish their importance relative to variables that do change. Another issue is that *any* change will receive more statistical weight than situations where someone has stable but high levels of the variable over the 2 time points. Of final note, it is important to recognize that in most cases, if change in the level of the variable within the individual is related to subsequent problem gambling, then between-subject differences in this variable in the previous assessment should also theoretically be related to problem gambling in subsequent assessments.

The choice of the particular statistical technique to use was guided by several considerations: a) the need to use a dichotomous dependent variable (i.e., problem gambling status); b) the need to simultaneously evaluate an extremely large number of independent variables (70 in QLS); c) the need to establish both the univariate and multivariate significance of each of these variables; d) identification of both the short term (i.e., next assessment) and long-term (4 assessments later) influence of these variables; e) maximizing use of the data (i.e., avoiding techniques that drop cases when the person has not completed all 5 (QLS) or 4 (LLLP) assessments); and f) using a technique and producing results that were both clear and comprehensible.

In the end, it was felt that these considerations and goals would be best met using a *series of pairwise logistic regressions on equivalent time intervals within each dataset and identifying consistencies in findings across these pairwise comparisons*. In other words, to look for consistencies in the influence of independent variables on future problem gambling at all:
- QLS 1 year intervals: A1→A2, A2→A3, A3→A4, A4→A5
- QLS 2 year intervals: A1→A3, A2→A4, A3→A5
- QLS 3 year intervals: A1→A4, A2→A5
- QLS 4 year intervals: A1→A5

And looking for consistencies in the influence of independent variables on future problem gambling at all:

- LLLP 20 month intervals: A1→A2, A2→A3, A3→A4
- LLLP 40 month intervals: A1→A3, A2→A4
- LLLP 60 month intervals: A1→A4

To allow for some cross-validation of findings for time intervals with only one comparison (i.e., QLS A1→A5 and LLLP A1→A4,) results for the full sample were compared to the same analysis conducted on subsets of the data, with each subset containing a random 50% of the sample.

In all analyses:

- The Statistical Package for the Social Sciences (SPSS 22.0) was employed.
- The dependent variable was problem gambling status. In QLS, people who had a designation of PPGM Problem or Pathological Gambler were classified as problem gamblers and people with a designation of PPGM Non-Gambler, Recreational Gambler, and At Risk Gambler were classified as non-problem gamblers. In LLLP, people who scored 5 and higher on the CPGI were classified as problem gamblers and people who had a CPGI score of 0 – 4 were classified as non-problem gamblers.
- Independent variables were used in the analysis as long as they:
  - Were either a significant univariate correlate or first onset predictor of problem gambling in either the QLS or LLLP (Appendices F, G, H, I). [23]
  - Allowed utilization of the entire sample. This excluded the variables of marital satisfaction, job satisfaction, job stress, and some gambling-specific variables that did not pertain to non-gamblers (e.g., membership in gambling rewards program, frequency of ATM use in gambling venues, all Gambling Context variables).
  - Were assessed in more than a single time period, so that the consistency of their influence within a certain time interval could be determined (this requirement did not apply to variables that are ostensibly invariant, e.g., personality, intelligence).
- Current gambling status was included as a predictor variable. As established earlier in this report, prediction of future problem gambling is strongly related to current gambling status, with evidence showing that about half of problem gamblers will continue to be problem gamblers in the next assessment. Including current gambling status in the analysis allowed us to determine the relative importance of current gambling status compared to other variables in predicting future problem gambling and the ability of these other variables to predict future problem gambling above and beyond existing gambling status.
- Entry of the variables into the equation was forward stepwise, with variable order entry determined by the size and significance of the Wald Statistic (minimum entry of p = .05).
- All nominal variables were dummy coded. Categorical variables with low category endorsements were collapsed: 'ethnic origins' was dichotomized into a Caucasian or non-Caucasian; 'personal values' in QLS was dichotomized into people reporting money was the most important thing to them or that money was not the most important thing to them.

---

[23] Gender was added to this list, even though it was not a significant univariate correlate or predictor in either QLS or LLLP.

People reporting 'unsure' as to whether their parents were problem gamblers were added to the 'yes or unsure' category.

- 'Unsure' or 'don't know' responses were replaced with the series mean in the following QLS continuous variables: number of close friends/family who are regular gambler; number of close friends/family who are problem gamblers. Series mean was also imputed for the small number of people who did not complete the Stanford Binet Matrices in the QLS and for the variable 'age first gambled for money'.

- In an effort to improve the validity of the gambling expenditure data, all positive values (indicative of people reporting *winning money in a typical month*) for the total gambling expenditure variable were converted to zero.[24] In addition, to reduce skew and the impact of outliers, values reported in the variables 'largest amount lost in past year', 'largest amount won in past year', and 'total gambling expenditure' were re-coded into categories.

- Although SPSS automatically prevents variables with multicollinearity and/or singularity from entering the regression, this was further enhanced by running collinearity diagnostics on all the assessment pairings to identify and eliminate all variables with variance inflation factors of 5 or more.[25]

- The data was weighted so that both problem gamblers and non-problem gamblers were given equal weighting in the classification to better ensure that the characteristics of the small number of problem gamblers were given equal consideration in the analyses.[26]

---

[24] In QLS Assessment 1 this constituted 12.4% of lottery players; 9.6% of instant lottery players; 2.7% of bingo players; 6.4% of EGM players; 2.2% of table game players; 5.9% of people playing games of skill against other people; 3.0% of sports bettors; 1.6% of horse race bettors; 3.3% of people who engaged in high risk stocks; and 0.7% of people reporting engaging in 'other' forms of gambling. Although some of these reports of 'typically winning' will be valid, most of them will not be. One of the cognitive distortions that occur among many problem gamblers is the belief that they 'typically win'. Changing all winning values to zero has been shown to significantly improve the correspondence of self-reported expenditure to actual expenditure for the group (Wood & Williams, 2007).

[25] Total gambling frequency was eliminated as a variable but frequency on individual formats retained; expenditure on individual forms of gambling was eliminated, but aggregate expenditure was retained. The decision to retain individual frequencies rather than individual expenditure was made because frequency of gambling on individual formats tended to be better predictors than expenditure on individual formats; because expenditure is inherently less reliable; and because of data quality issues with LLLP individual expenditure data. The NEO facet of Depression was eliminated, but the DSM diagnosis of major depression was retained; the NEO domain of Neuroticism was eliminated, but the subdomains of Impulsivity and Vulnerability were retained; level of life satisfaction was eliminated but level of happiness was retained.

[26] The statistical goal of logistic regression is to achieve the highest overall classification accuracy. When one of the 2 groups constitutes between 96% - 98% of the total sample (as is the case with the non-problem group), then maximum classification accuracy is accomplished by variable weighting that attempts to correctly assign as many of these non-problem gamblers to the non-problem gambling group as possible. As a result, the classification accuracy of the non-problem gambling group is usually close to 100%, but the classification accuracy of the problem gambling group is generally much less than 50%. While there is nothing wrong with this approach, these results are best understood as finding predictive of future *non-problem gambling* rather than the prediction of future problem gambling. While the prediction of future non-problem gambling is obviously related to the prediction of problem gambling (many of the same variables will be implicated), *they are not exactly the same*. Weighting the problem gambling group such that it receives equal consideration (and classification accuracy) in the

The same procedures and variables used in the QLS analyses were also employed in the LLLP analyses, with the following exceptions:

- There were several variables in the QLS analyses not available in the LLLP analyses. There were also 2 independent variables used in the LLLP analyses that were not available in the QLS analyses:
    - Maximum Time Spent Gambling (as measured by the maximum amount indicated on any individual format in past year).
    - Scores on the Adult Attention Deficit Hyperactivity Disorder Self-Report Scale (Kessler et al., 2005).
- Some variables were not used in the LLLP analyses due to erroneous coding or because of missing data: Motivation for gambling was not used due to missing data in Assessment 1 and 2. Dissociation during gambling was not used due to missing data in Assessment 1 and 2. Expenditure on individual forms of gambling was not used due different handling of the variable depending on the assessment period (in Assessments 3 and 4 all values were converted to their absolute value, even though in many cases the person was reporting a win). Distance to nearest EGM venue was not used as it was not available in the main dataset.
- Some time periods for certain variables were not used in the LLLP analyses due to missing data: number of close friends who are regular gamblers (Assessment 2); number of family members who are regular gamblers (Assessment 2); number of close friends who are problem gamblers (Assessment 2); number of family members who are problem gamblers (Assessment 2); post-traumatic stress (Assessment 3); panic disorder and agoraphobia (Assessment 2); alcohol dependence (Assessments 2 and 3). In most of these cases, the data from the previous year was used.

In addition to several variables not being assessed in both datasets, there were several variables that were assessed differently in LLLP compared to QLS, with the following ones being the most divergent:

- In QLS, the aggregate measure of gambling frequency was the total frequency of gambling for all types combined, whereas in LLLP it was the maximum frequency reported on any individual type.
- QLS asked whether the person had been exposed to any problem gambling prevention or awareness campaigns at work or school. Similarly, LLLP had a question about whether a person 'had attended an information session on problem gambling'. However, this question was administered in the treatment section of the LLLP questionnaire and was *positively* correlated with CPGI scores, suggesting that many people who answered this question in the affirmative were reporting on what they received in treatment (rather than whether they had been exposed to a prevention initiative).
- Child abuse was assessed with a single question in QLS, whereas in LLLP it was assessed with the Childhood Trauma Scale (Bernstein et al., 1997).

---

analysis ensures that the results are relevant both to the prediction of both future problem gambling (the actual focus of the present investigation) as well as the prediction of future non-problem gambling.

- Family functioning was assessed with a single question in QLS, whereas it was assessed with the Family Environment Scale in LLLP (Moos & Moos, 2009).
- Lack of social support was assessed with the Social Non-Support Scale in the Personality Assessment Inventory in QLS but with the Lubben Social Network Scale in LLLP (Lubben, 1988).
- Mental health disorders were assessed in both datasets using the CIDI DSM-IV-TR criteria. However, in LLLP the CIDI was only administered in Assessments 1, 3, and 4. The Personality Assessment Inventory, which provided a continuous score for various mental health areas, was administered in LLLP in Assessments 1, 2, and 4. In the LLLP analyses, the PAI scores were used when available. However, CIDI mental health designations were used to assess depression, generalized anxiety, and obsessive compulsive disorder in Assessment 3. In addition, panic disorder and agoraphobia were assessed exclusively with the CIDI.
- The QLS estimated intelligence using the Stanford Binet Matrices subtest, whereas the LLLP assessed intelligence using the Wechsler Abbreviated Scale of Intelligence (WASI) (PsychCorp, 1999).

Univariate Prediction of Future Problem Gambling in QLS and LLLP

The ability of each individual variable to independently predict problem gambling at each future time period was established by examining its Score statistic in the SPSS output at Step 0 (i.e., prior to its entry into the logistic regression). The Score statistic represents the improvement in the prediction of future problem gambling over a constant-only model if the variable is added to the equation (it is asymptotically equivalent to the Wald statistic as well as being equal to a *t* statistic when the data follows a normal distribution and a chi-squared statistic when the data consists of binary observations).

A summary of the univariate results is contained in Table 17. Blue (QLS) or purple (LLLP) highlighting identifies variables that were consistent predictors within each time interval as established by having a Score statistic $\geq$ 25 in the majority of comparisons, and with the same direction of effect in each case.[27] 'Majority of comparisons' means:

3/4 when there were 4 comparisons within a time interval:
- QLS 1 year intervals: A1→A2, A2→A3, A3→A4, A4→A5

2/3 when there were 3 comparisons within a time interval:
- QLS 2 year intervals: A1→A3, A2→A4, A3→A5
- LLLP 20 month intervals: A1→A2, A2→A3, A3→A4

2/2 when there were 2 comparisons within a time interval:
- QLS 3 year intervals: A1→A4, A2→A5
- LLLP 40 month intervals: A1→A3, A2→A4

The variable needed to have a Score statistic of 25 or higher for <u>all</u> *cases when the comparisons involved random subsamples of the same data*
- QLS 4 year intervals: A1→A5, A1a→A5a, A1b→A5b, A1c→A5c
- LLLP 60 month intervals: A1→A4, A1a→A4a, A1b→A4b

When variable information was not collected during a particular time period it is denoted by '—'.

---

[27] The Score statistic was set very high (equivalent to a *p* value < .000001) due to the very large sample sizes as well as the fact that the constant-only model had *no* predictive power, as problem and non-problem gamblers were weighted equally (thus, if the variable had *any* association with problem gambling it was very easy to achieve statistical significance at conventional significance levels).

Table 17. Consistent **Univariate** Predictors of Future Problem Gambling for Each Time Interval in QLS and LLLP.

	1 Assessment Later		2 Assessments Later		3 Assessments Later		4 Assessments Later
	QLS	LLLP	QLS	LLLP	QLS	LLLP	QLS
DEMOGRAPHICS							
Male							
Younger Age							
Non-Caucasian	X		X				
Lower Educational Attainment	X	X	X		X		X
PHYSICAL HEALTH							
Physical disability	X	X	X	X			
Lower physical health rating	X	X	X	X		X	
GAMBLING							
Gambling Attitudes (less positive)	X		X		X		
Big win prior to 19 (QLS); Big win when 1st started gambling (LLLP)		X		X		X	
Parents/sibs regular gamblers when person growing up; &/or currently (LLLP)		X		X		X	
Parents or sibs gambled with person when growing up; parents only (LLLP)	X	X	X		X		X
Parents/sibs problem gamblers when person growing up; &/or currently (LLLP)		X		X		X	
Lottery ticket frequency		X	X	X	X	X	
Instant win ticket frequency		X	X	X	X	X	
Bingo frequency		X	X	X			
EGM frequency		X	X	X	X	X	X
Casino table game frequency		X	X	X			
Social games of skill frequency (QLS); Private games for $ frequency (LLLP)	X	X	X	X			
Sports betting frequency	X	X	X	X			
Horse or dog racing frequency	X		X				
High risk stock frequency	X		X		X	X	
Gambled on Internet			X				X
TOTAL NUMBER OF GAMBLING TYPES ENGAGED IN	X	X	X	X	X	X	X
EXPENDITURE ON ALL TYPES COMBINED	X	X	X	X	X	X	
Largest single day loss	X		X		X		X

		1 Assessment Later		2 Assessments Later		3 Assessments Later		4 Assessments Later
		QLS	LLLP	QLS	LLLP	QLS	LLLP	QLS
PAST YEAR GAMBLING	Largest single day win		--		--		--	
	TOTAL TIME SPENT GAMBLING	--		--		--		--
	PPGM (QLS) or CPGI (LLLP) GAMBLING CATEGORY							
GAMBLING MOTIVATION	Excitement/entertainment/fun		--		--		--	
	To win money		--		--		--	
	Escape/distraction (QLS); dissociation while gambling (LLLP)		--		--		--	
	To socialize		--		--		--	
	Not to support worthy causes		--		--		--	
	To feel good about self		--		--		--	
	Other motivation		--		--		--	
GAMBLING EXPOSURE	# close friends/family regular gamblers (friends only in LLLP)							
	# of close friends and family with gambling problems		--		--		--	
	Distance (km) to nearest EGM venue		--		--		--	
	Gambling Fallacies							
PERSONALITY								
	Vulnerability (higher)							
	Impulsivity (higher)							
	Excitement Seeking							
	Agreeableness (lower)							
	Conscientiousness (lower)							
STRESS								
	Number of stressful life events in past year							
WELL BEING	Stress level (higher)		--		--		--	
	Happiness level (lower)		--		--		--	
	Abused as a child							
	Other past trauma that still impacts today		--		--		--	
MENTAL HEALTH								
	Post-Traumatic Stress							

	1 Assessment Later		2 Assessments Later		3 Assessments Later		4 Assessments Later
	QLS	LLLP	QLS	LLLP	QLS	LLLP	QLS
MENTAL DISORDERS							
Major Depressive Disorder							
Generalized Anxiety Disorder							
Panic Attacks &/or Agoraphobia							
Obsessive Compulsive Disorder							
Eating Disorder							
Attention Deficit Hyperactivity	--		--		--		--
ANY MENTAL DISORDER		--		--		--	
SUBSTANCE USE, ABUSE, AND DEPENDENCE							
Tobacco user in past year							
Alcohol use in past year (QLS); Level of alcohol use in past year(LLLP)							
Illicit drug use in past year							
Substance abuse or dependence (QLS); drug dependence (LLLP)							
Behavioural Addiction in past year		--		--		--	
LIFETIME MENTAL HEALTH (prior to past 12 months)							
Lifetime history of addiction to drugs/alcohol		--		--		--	
Lifetime history of behavioural addiction		--		--		--	
Parents/siblings have history of addiction		--		--		--	
Lifetime history of mental health problems		--		--		--	
Parents/siblings have history of mental health problems		--		--		--	
SOCIAL FUNCTIONING							
SOCIAL FUNCTIONING AND SUPPORT							
Social Support (lower)							
Family functioning (lower)							
Community quality & involvement (lower)							
RECREATION — Gambling is 1 of 5 favourite leisure activities		--		--		--	
ILLEGAL BEHAVIOUR AND ANTISOCIALITY — Number of Illegal activities in lifetime		--		--		--	
Number of Illegal activities in past year		--		--		--	
Antisociality							
COGNITIVE FUNCTIONING							
Lower Intelligence							

Multivariate Prediction of Future Problem Gambling in QLS

The value of multivariate analysis is that it allows us to determine whether significant individual variables have overlapping versus unique predictive power as well as the extent to which these individual variables can collectively predict future problem gambling. As can be seen in the table below, all QLS logistic regressions were able to account for the large majority of the variance and had correspondingly very high levels of classification accuracy. Somewhat surprisingly, the percentage of variance accounted for did not vary as a function of time interval.

Table 18. Logistic Regressions Predicting Subsequent QLS PPGM Problem Gambling Status.

Assessment Periods	Comparison of a Model Containing the Predictors Against a Constant-Only Model	Nagelkerke R Squared	Overall Prediction Success
A1 → A2	χ^2 (44, N =3939) = 3091, p < .0001	72.5%	88.0%
A2 → A3	χ^2 (43, N = 3821) = 2856, p < .0001	70.6%	87.1%
A3 → A4	χ^2 (44, N = 3714) = 3315, p < .0001	79.7%	91.6%
A4 → A5	χ^2 (39, N = 3690) = 4134, p < .0001	90.4%	95.6%
A1 → A3	χ^2 (43, N = 3900) = 2846, p < .0001	69.1%	87.5%
A2 → A4	χ^2 (33, N = 3761) = 3059, p < .0001	74.5%	89.1%
A3 → A5	χ^2 (46, N = 3665) = 3669, p < .0001	86.1%	94.3%
A1 → A4	χ^2 (46, N = 3828) = 2817, p < .0001	69.5%	87.4%
A2 → A5	χ^2 (49, N = 3722) = 3412, p < .0001	80.8%	90.9%
A1 → A5	χ^2 (53, N = 3798) = 3101, p < .0001	74.4%	88.1%

The following tables identify the regression coefficients and p values of variables that were statistically significant in each of the QLS logistic regressions. Blank cells indicate that the variable did not achieve sufficient statistical significance to be part of the final regression equation. There are 4 tables with 4 time periods reported: prediction of problem gambling in the following year, 2 years later; 3 years later; and 4 years later. Blue highlighting identifies variables that were statistically significant in the majority of comparisons within each time interval (and had their coefficients in the same direction). This represented 3/4 comparisons for the 1 year time interval, 2/3 comparisons for the 2 year time interval, and 2/2 for the 3 year time interval. Because the 4 year time interval comparisons involved random subsamples of the same 4 year time interval data, 4/4 comparisons needed to be significant.

Table 19. Variables Predicting PPGM Problem Gambling Status in the **Following Year** in the QLS.

	A1 → A2		A2 → A3		A3 → A4		A4 → A5	
	B	p	B	p	B	p	B	p
Gender (1=male; 2=female)					-.63	.0001		
Age			-.01	.0151				
Non-Caucasian			.40	.0132	.65	.0005	-.74	.0232
Educational Attainment	-.82	.0000						
Physical Disability or Chronic Health Problem			-.57	.0005				
Rating of Physical Health in Past Year	.16	.0115					-.51	.0000
Big Gambling Win Prior to 19	.98	.0190			-4.57	.0000	-2.8	.0018
Parents/Sibs Were Regular Gamblers							.00	.0000
Parents/Siblings Gambled with Person	-.53	.0027			.56	.0036	-2.00	.0000
Parents/Sibs Were PGs when Growing Up			-.70	.0215			.85	.0580
Gambling Attitudes	-.11	.0030	-.12	.0027			-.69	.0000
Lottery Frequency in Past Year							-.21	.0000
Instant Win Frequency in Past Year	.04	.0423	.08	.0000			.16	.0000
Bingo Frequency in Past Year	.19	.0000						
EGM Frequency in Past Year	.12	.0004	.15	.0000			.42	.0000
Table Game Frequency in Past Year					-.13	.0003	-.26	.0001
Games of Skill Frequency in Past Year			-.19	.0000	.17	.0000		
Sports Betting Frequency in Past Year			-.08	.0003			.23	.0000
Horse Race Betting Frequency in Past Year					.36	.0000		
High Risk Stock Frequency in Past Year			.19	.0013	.15	.0044	.13	.0235
Internet Gambling in Past Year	.77	.0001	.53	.0168			.80	.0297
TOTAL NUMBER OF GAMBLING TYPES			.10	.0265	.20	.0001	.61	.0000
TOTAL GAMBLING EXPENDITURE	.05	.0428	.09	.0000			.08	.0145
Largest Gambling Loss in Past Year			-.18	.0116	.24	.0101	.75	.0000
Largest Gambling Win in Past Year	.35	.0000	.30	.0000	.14	.0082	.23	.0089
Motivation for Gambling								
For Fun or Excitement					.42	.0075		
To Win Money	.26	.0369	1.06	.0000			.49	.0482
To Escape or Distract Myself			.84	.0000				
To Support Worthy Causes			-1.3	.0000	.82	.0030		
To Feel Good About Self			-2.8	.0002	-2.4	.0002		
# Close Friends & Family Regular Gamblers			.32	.0000	.42	.0001	.21	.0478
# Close Friends & Family Problem Gamblers			3.60	.0506	.82	.0000	1.54	.0000
# Household Members who are PGs	-.87	.0164	.99	.0000	-1.11	.0004	-4.46	.0000
Gambling Fallacies (lower = more fallacies)			-.20	.0000	-.20	.0000	-.21	.0049
Distance to Nearest EGM Venue	-.02	.0000						
PPGM Category	1.78	.0000	1.74	.0000	2.37	.0000	2.40	.0000
NEO Vulnerability facet	-.07	.0000	-.13	.0000	.05	.0437		
NEO Impulsivity facet	.12	.0000			.14	.0000	.15	.0000
NEO Excitement Seeking facet					-.04	.0401		
NEO Agreeableness					.09	.0000		

	A1 → A2		A2 → A3		A3 → A4		A4 → A5	
	B	p	B	p	B	p	B	p
NEO Conscientiousness			-.09	.0000				
# Negative Life Events in Past Year	.11	.0001			.14	.0022		
Rated Level of Stress in Past Year	.36	.0000	-.15	.0092	-.27	.0002		
Rated Level of Happiness in Past Year			-.27	.0001	-.21	.0109		
Abused as Child	.44	.0009						
Lifetime Trauma that Still Impacts Today			.48	.0001	.57	.0004	-1.4	.0000
Post-Traumatic Stress	-.64	.0236	.79	.0356				
Major Depression	-.89	.0000	1.06	.0002	.63	.0035	-2.58	.0000
Generalized Anxiety	-.81	.0035			-.78	.0303		
Panic Attacks and Agoraphobia					-.60	.0198		
Obsessive Compulsive Disorder	2.34	.0000						
Bulimia			-2.32	.0008				
ANY MENTAL DISORDER	1.21	.0000	-1.02	.0004			1.77	.0001
Tobacco User in Past Year							-1.57	.0000
Alcohol User in Past Year	-.69	.0000						
Illicit Drug User in Past Year			.70	.0000	-1.00	.0000		
Substance Abuse/Dependence in Past Year	.66	.0013			2.10	.0000	2.49	.0000
Behavioural Addiction in Past Year	1.02	.0000	.74	.0006			2.75	.0000
Lifetime History of Drug/Alcohol Addiction	-.91	.0001						
Lifetime History of Behavioural Addiction	1.04	.0000	1.70	.0000				
Lifetime History of Mental Health Disorder	-.35	.0463			-.67	.0052		
Family History of Mental Health Problems								
Lack of Social Support	-.04	.0154						
Family Functioning								
Community Quality	-.07	.0365	.08	.0126	.14	.0006	-.27	.0002
Community Involvement			.05	.0121			.33	.0000
Gambling a Top 5 Leisure Activity			.89	.0000	1.46	.0000	2.02	.0000
Antisociality Score	-.02	.0044	-.03	.0014				
Number of Illegal Activities in Past Year	-.34	.0054						
Intelligence								

Table 20. Variables Predicting PPGM Problem Gambling Status **Two Years Later** in the QLS.

	A1 → A3		A2 → A4		A3 → A5	
	B	*p*	*B*	*p*	*B*	*p*
Gender (1=male; 2=female)					-1.23	.0000
Age						
Non-Caucasian	.59	.0000	1.26	.0000		
Educational Attainment						
Physical Disability or Chronic Health Problem					.92	.0010
Rating of Physical Health in Past Year			.45	.0000		
Big Gambling Win Prior to 19	-.97	.0301	-3.82	.0000	-5.91	.0000
Parents/Sibs Were Regular Gamblers	.00	.0455			.00	.0000
Parents/Siblings Gambled with Person	.53	.0006				
Parents/Sibs Were PGs when Growing Up						
Gambling Attitudes	-.11	.0025	-.33	.0000		
Lottery Frequency in Past Year			.09	.0000	-.21	.0000
Instant Win Frequency in Past Year	.07	.0000			.24	.0000
Bingo Frequency in Past Year						
EGM Frequency in Past Year			.13	.0018		
Table Game Frequency in Past Year			.27	.0000	.96	.0004
Games of Skill Frequency in Past Year	-.06	.0049	.13	.0000		
Sports Betting Frequency in Past Year			-.12	.0002		
Horse Race Betting Frequency in Past Year	-.17	.0000	.96	.0000	-.31	.0013
High Risk Stock Frequency in Past Year	.26	.0004	.25	.0000		
Internet Gambling in Past Year			.44	.0594	.47	.0147
TOTAL NUMBER OF GAMBLING TYPES					.34	.0000
TOTAL GAMBLING EXPENDITURE					.11	.0000
Largest Gambling Loss in Past Year			.47	.0000		
Largest Gambling Win in Past Year	.20	.0000	.12	.0157	.49	.0000
Motivation for Gambling						
For Fun or Excitement	.61	.0000				
To Win Money	1.11	.0000			.99	.0000
To Escape or Distract Myself	1.48	.0000	.52	.0169	2.29	.0000
To Support Worthy Causes	-1.56	.0000			-4.20	.0000
To Feel Good About Self	-6.21	.0000			-5.71	.0000
# Close Friends & Family Regular Gamblers	.29	.0012				
# Close Friends & Family Problem Gamblers			.93	.0000	.69	.0000
# Household Members who are PGs	.69	.0049	-1.66	.0000	-2.46	.0000
Gambling Fallacies (lower = more fallacies)			-.31	.0000		
Distance to Nearest EGM Venue	-.01	.0087			.01	.0026
PPGM Category	1.51	.0000	1.71	.0000	2.58	.0000
NEO Vulnerability facet	-.11	.0000				
NEO Impulsivity facet	.03	.0103	.12	.0000	.13	.0000
NEO Excitement Seeking facet	-.07	.0000			-.09	.0004
NEO Agreeableness			.08	.0000	-.08	.0000

	A1 → A3		A2 → A4		A3 → A5	
	B	*p*	*B*	*p*	*B*	*p*
NEO Conscientiousness	-.11	.0000			-.06	.0019
# Negative Life Events in Past Year	-.10	.0005				
Rated Level of Stress in Past Year						
Rated Level of Happiness in Past Year			-.31	.0000		
Abused as Child					.64	.0017
Lifetime Trauma that Still Impacts Today					-1.06	.0000
Post-Traumatic Stress	.73	.0091				
Major Depression	1.76	.0000				
Generalized Anxiety			-1.77	.0000	-3.81	.0000
Panic Attacks and Agoraphobia	1.07	.0000	-1.02	.0000		
Obsessive Compulsive Disorder			2.14	.0001	2.77	.0000
Bulimia	1.79	.0000			-4.40	.0024
ANY MENTAL DISORDER	-1.23	.0000			1.27	.0000
Tobacco User in Past Year	.63	.0000	.29	.0214	-1.12	.0000
Alcohol User in Past Year					.81	.0004
Illicit Drug User in Past Year			.76	.0000		
Substance Abuse/Dependence in Past Year	.66	.0005	.36	.0405		
Behavioural Addiction in Past Year	-.39	.0963			2.15	.0000
Lifetime History of Drug/Alcohol Addiction	-.52	.0111			1.45	.0000
Lifetime History of Behavioural Addiction	1.40	.0000				
Lifetime History of Mental Health Disorder						
Family History of Mental Health Problems						
Lack of Social Support						
Family Functioning						
Community Quality			-.14	.0000	.29	.0000
Community Involvement	.07	.0009			-.13	.0001
Gambling a Top 5 Leisure Activity	.55	.0000	.82	.0000	.82	.0005
Antisociality Score	.02	.0417				
Number of Illegal Activities in Past Year					-3.53	.0000
Intelligence					-.05	.0043

Table 21. Variables Predicting PPGM Problem Gambling Status **Three Years Later** in the QLS.

	A1 → A4		A2 → A5	
	B	*p*	*B*	*p*
Gender (1=male; 2=female)	-.46	.0003	-.59	.0011
Age				
Non-Caucasian	.86	.0000		
Educational Attainment			-.77	.0000
Physical Disability or Chronic Health Problem			.58	.0037
Rating of Physical Health in Past Year	.37	.0000		
Big Gambling Win Prior to 19	-1.45	.0038	-2.51	.0001
Parents/Sibs Were Regular Gamblers				
Parents/Siblings Gambled with Person	.44	.0060		
Parents/Sibs Were PGs when Growing Up				
Gambling Attitudes			-.23	.0000
Lottery Frequency in Past Year			-.11	.0000
Instant Win Frequency in Past Year			.24	.0000
Bingo Frequency in Past Year	.07	.0256		
EGM Frequency in Past Year	.23	.0000	.23	.0000
Table Game Frequency in Past Year			-.28	.0000
Games of Skill Frequency in Past Year			.05	.0586
Sports Betting Frequency in Past Year				
Horse Race Betting Frequency in Past Year	.16	.0031		
High Risk Stock Frequency in Past Year	.30	.0000	.18	.0004
Internet Gambling in Past Year	-.68	.0040	1.30	.0000
TOTAL NUMBER OF GAMBLING TYPES	.20	.0000	-.22	.0004
TOTAL GAMBLING EXPENDITURE	-.09	.0002	.07	.0099
Largest Gambling Loss in Past Year			.39	.0004
Largest Gambling Win in Past Year	.34	.0000	.33	.0000
Motivation for Gambling				
For Fun or Excitement	-.40	.0019	-1.34	.0000
To Win Money			-7.15	.0000
To Escape or Distract Myself	1.39	.0000	3.05	.0000
To Support Worthy Causes	-.48	.0264		
To Feel Good About Self			.20	.0359
# Close Friends & Family Regular Gamblers	.21	.0044	.50	.0001
# Close Friends & Family Problem Gamblers	.85	.0000		
# Household Members who are PGs	.49	.0475		
Gambling Fallacies (lower = more fallacies)	-.07	.0454	-.15	.0025
Distance to Nearest EGM Venue	-.01	.0075		
PPGM Category	1.63	.0000	1.87	.0000
NEO Vulnerability facet			-.11	.0000
NEO Impulsivity facet	.13	.0000	.14	.0000
NEO Excitement Seeking facet				
NEO Agreeableness	.09	.0000		

	A1 → A4		A2 → A5	
	B	*p*	*B*	*p*
NEO Conscientiousness	.03	.0054	-.05	.0021
# Negative Life Events in Past Year				
Rated Level of Stress in Past Year			.49	.0000
Rated Level of Happiness in Past Year	-.42	.0000	-.18	.0486
Abused as Child	-.55	.0001		
Lifetime Trauma that Still Impacts Today				
Post-Traumatic Stress	1.58	.0000		
Major Depression				
Generalized Anxiety	-1.72	.0000	-1.85	.0000
Panic Attacks and Agoraphobia				
Obsessive Compulsive Disorder	2.39	.0000	-3.64	.0000
Bulimia				
ANY MENTAL DISORDER				
Tobacco User in Past Year			-.72	.0000
Alcohol User in Past Year	.85	.0000		
Illicit Drug User in Past Year			-.80	.0029
Substance Abuse/Dependence in Past Year				
Behavioural Addiction in Past Year			.59	.0314
Lifetime History of Drug/Alcohol Addiction	-.81	.0005	1.32	.0000
Lifetime History of Behavioural Addiction	-.59	.0262		
Lifetime History of Mental Health Disorder				
Family History of Mental Health Problems	.41	.0179	.71	.0005
Lack of Social Support			-.09	.0015
Family Functioning	-.11	.0323	-.21	.0040
Community Quality				
Community Involvement			.14	.0000
Gambling a Top 5 Leisure Activity				
Antisociality Score			.05	.0001
Number of Illegal Activities in Past Year			-1.45	.0004
Intelligence				

Table 22. Variables Predicting PPGM Problem Gambling Status **Four Years Later** in the QLS.

	A1 → A5		A1a → A5a		A1b → A5b		A1c → A5c	
	B	p	B	p	B	p	B	p
Gender (1=male; 2=female)	-.37	.0157	-.53	.0120	.80	.0003	-.98	.0004
Age	-.02	.0012	-.03	.0004	.03	.0016	-.05	.0000
Non-Caucasian							.79	.0103
Educational Attainment	-.98	.0000	-1.65	.0000			-1.77	.0000
Physical Disability or Chronic Health Problem	.53	.0023	.60	.0128				
Rating of Physical Health in Past Year					-.24	.0136		
Big Gambling Win Prior to 19	-2.31	.0000	-3.06	.0000	-2.82	.0000	-4.09	.0000
Parents/Sibs Were Regular Gamblers							1.50	.0043
Parents/Siblings Gambled with Person								
Parents/Sibs Were PGs when Growing Up								
Gambling Attitudes	-.11	.0102					.24	.0071
Lottery Frequency in Past Year	-.06	.0024			-.12	.0000		
Instant Win Frequency in Past Year	.13	.0000			.17	.0000	.16	.0000
Bingo Frequency in Past Year					-.35	.0000	-.14	.0440
EGM Frequency in Past Year	.19	.0000	.31	.0000	.23	.0000	.41	.0000
Table Game Frequency in Past Year								
Games of Skill Frequency in Past Year	-.17	.0000			-.18	.0004		
Sports Betting Frequency in Past Year					.10	.0130		
Horse Race Betting Frequency in Past Year								
High Risk Stock Frequency in Past Year	.43	.0000	.66	.0000				
Internet Gambling in Past Year								
TOTAL NUMBER OF GAMBLING TYPES			-.36	.0000			-.50	.0000
TOTAL GAMBLING EXPENDITURE	.16	.0000	.08	.0235	.22	.0000		
Largest Gambling Loss in Past Year								
Largest Gambling Win in Past Year	.13	.0287	.26	.0011	.39	.0000	.37	.0000
Motivation for Gambling								
For Fun or Excitement			-1.68	.0000			-1.36	.0000
To Win Money	-.70	.0000	-.74	.0006				
To Escape or Distract Myself	1.26	.0000	1.83	.0000	1.18	.0004	1.83	.0007
To Support Worthy Causes	-1.49	.0000	-1.36	.0003	-1.15	.0049	-1.38	.0109
To Feel Good About Self	1.60	.0027	-6.37	.0000			-5.23	.0000
# Close Friends & Family Regular Gamblers	.24	.0020			.42	.0003	.46	.0009
# Close Friends & Family Problem Gamblers	.63	.0000	.77	.0000	.44	.0033		
# Household Members who are PGs	-.88	.0023	-.87	.0431				
Gambling Fallacies (lower = more fallacies)								
Distance to Nearest EGM Venue								
PPGM Category	1.57	.0000	2.14	.0000	2.07	.0000	2.35	.0000
NEO Vulnerability facet	-.17	.0000	-.20	.0000	-.21	.0000	-.22	.0000
NEO Impulsivity facet	.18	.0000	.31	.0000	.20	.0000	.45	.0000
NEO Excitement Seeking facet			.11	.0000			.09	.0036
NEO Agreeableness			.08	.0002			.09	.0008

	A1 → A5		A1a → A5a		A1b → A5b		A1c → A5c	
	B	p	B	p	B	p	B	p
NEO Conscientiousness	-.04	.0035	-.06	.0066	-.06	.0052	-.05	.0076
# Negative Life Events in Past Year	-.26	.0000	-.43	.0000			-.60	.0000
Rated Level of Stress in Past Year	.193	.0018						
Rated Level of Happiness in Past Year	-.27	.0006	-.56	.0000			-.65	.0000
Abused as Child								
Lifetime Trauma that Still Impacts Today	-.54	.0005					-1.45	.0000
Post-Traumatic Stress					-1.59	.0008		
Major Depression								
Generalized Anxiety	-1.81	.0000	-2.33	.0000			-4.03	.0000
Panic Attacks and Agoraphobia	.55	.0020	.60	.0088	.85	.0006		
Obsessive Compulsive Disorder	1.50	.0007			1.61	.0018	3.91	.0000
Bulimia			-5.19	.0026			-5.90	.0049
ANY MENTAL DISORDER	.95	.0000	1.45	.0000			3.04	.0000
Tobacco User in Past Year	-.96	.0000	1.37	.0000	1.12	.0000	-2.76	.0000
Alcohol User in Past Year								
Illicit Drug User in Past Year	-1.12	.0000						
Substance Abuse/Dependence in Past Year			.75	.0268			2.19	.0000
Behavioural Addiction in Past Year	-1.32	.0000	-8.36	.0000				
Lifetime History of Drug/Alcohol Addiction	.76	.0005	1.21	.0001	1.11	.0003	1.71	.0000
Lifetime History of Behavioural Addiction								
Lifetime History of Mental Health Disorder							-1.68	.0002
Family History of Mental Health Problems	1.15	.0000	1.19	.0000	1.95	.0000	2.36	.0000
Lack of Social Support	-.10	.0000	-.16	.0000				
Family Functioning	-.32	.0000	-.42	.0000			-.57	.0000
Community Quality	.14	.0003			.11	.0296		
Community Involvement			-.13	.0001			-.17	.0002
Gambling a Top 5 Leisure Activity	-.48	.0060						
Antisociality Score	.04	.0005	.07	.0000	.04	.0010		
Number of Illegal Activities in Past Year	-.43	.0153	-1.17	.0000				
Intelligence	-.03	.0118					-.08	.0003

Multivariate Prediction of Future Problem Gambling in LLLP

A comparable set of logistic regressions were conducted on the LLLP dataset examining independent variables and their relationship with CPGI 5+ Status in subsequent assessments. As can be seen in the table below, and similar to QLS, all analyses were able to account for the large majority of the variance and had correspondingly very high levels of classification accuracy. As was the case with the QLS analyses, the percentage of variance accounted for did not vary as a function of time interval examined.

Table 23. Logistic Regressions Predicting Subsequent LLLP CPGI 5+ Problem Gambling Status.

Assessment Periods	Comparison of a Model Containing the Predictors Against a Constant-Only Model	Nagelkerke R Squared	Overall Prediction Success
A1 → A2	χ^2 (25, N = 853) = 704, p < .0001	72.5%	88.6%
A2 → A3	χ^2 (25, N = 752) = 841, p < .0001	87.7%	96.6%
A3 → A4	χ^2 (19, N = 713) = 745, p < .0001	85.5%	93.6%
A1 → A3	χ^2 (27, N = 867) = 875, p < .0001	81.8%	94.9%
A2 → A4	χ^2 (30, N = 731) = 801, p < .0001	86.6%	96.3%
A1 → A4	χ^2 (24, N = 838) = 860, p < .0001	84.1%	95.7%

The following tables list each independent variable along with its coefficient and the statistical significance of its Wald statistic. There are 3 tables with 3 time periods reported: prediction of problem gambling in the next assessment, 2 assessments later, and 3 assessments later. Blank cells indicate that the variable did not achieve sufficient statistical significance to be part of the final regression equation. Purple highlighting identifies variables that were statistically significant in the majority of comparisons within each time interval (and with the coefficients in the same direction). This represented 2/3 comparisons for the 1 year time interval and 2/2 for the 2 year time interval. Because the 3 year time interval comparisons involved random subsamples of the same data, 3/3 comparisons needed to be significant in order for the variable to be highlighted.

Table 24. Variables Predicting CPGI 5+ Problem Gambling **in the Next Assessment** in the LLLP.

	A1 → A2		A2 → A3		A3 → A4	
	B	*p*	*B*	*p*	*B*	*p*
Gender (1=male; 2=female)			-1.53	.0228		
Age					-.08	.0000
Non-Caucasian	1.08	.0031				
Educational Attainment	.34	.0000				
Physical Functionality (higher = more function)					-1.87	.0000
Physical Health Rating					1.37	.0000
Big Win when 1st Started Gambling	1.93	.0000				
Big Loss when 1st Started Gambling			4.28	.0000		
Parents Gambled with Person when Growing Up					-1.60	.0000
Parents were/are Regular Gamblers	1.60	.0000	3.32	.0000	2.17	.0000
Parents were/are Problem Gamblers			-1.62	.0416		
Siblings were/are Problem Gamblers			-8.50	.0000		
Gambling Attitudes	-.31	.0002				
Lottery Frequency in Past Year					.41	.0013
Instant Win Frequency in Past Year						
Bingo Frequency in Past Year	.38	.0045	1.35	.0000		
EGM Frequency in Past Year	1.10	.0000			1.27	.0000
Table Game Frequency in Past Year	.51	.0039	1.26	.0000	.68	.0035
Private games for $ in Past Year						
Sports Betting Frequency in Past Year	.61	.0000	1.05	.0000		
Horse Race Betting Frequency in Past Year	-.94	.0046				
High Risk Stock Frequency in Past Year			1.59	.0003		
Internet Gambling in Past Year			-3.75	.0003		
TOTAL NUMBER OF GAMBLING TYPES	.74	.0000			1.03	.0000
TOTAL GAMBLING EXPENDITURE	.48	.0000	-.38	.0447		
Maximum Single Day Gambling Loss in Past Year	.01	.0000				
TOTAL TIME SPENT GAMBLING					.01	.0000
% of Close Friends that Gamble Regularly						
Gambling Fallacies (lower = more fallacies)	-.36	.0000	-.33	.0250	-1.71	.0000
CPGI Category	.96	.0044	3.95	.0000	2.61	.0000
NEO Vulnerability facet			.26	.0010		
NEO Impulsivity facet	.11	.0002	.23	.0008	.10	.0250
NEO Excitement Seeking						
NEO Agreeableness						
NEO Conscientiousness			.12	.0076		
Life Events in Past Year			.31	.0003		
Childhood Trauma	.05	.0000	.06	.0002	-.07	.0006
Post-Traumatic Stress						
Depression	-.09	.0000	.00	.9587		
Anxiety						

	A1 → A2		A2 → A3		A3 → A4	
	B	*p*	*B*	*p*	*B*	*p*
Panic Attacks						
Agoraphobia						
Obsessive Compulsive Disorder			.32	.0001		
ADHD	.56	.0000				
Tobacco User	.93	.0016	5.59	.0000		
Alcohol Use Status	-.44	.0130				
Illicit Drug User			-2.65	.0002		
Alcohol Dependence	-1.18	.0082				
Drug Dependence						
Social Support (0=isolated; 3=not isolated)	-.60	.0002				
Family Functioning	.17	.0284				
Community Quality						
Antisociality Score			-.13	.0006		
Intelligence						

Table 25. Variables Predicting CPGI 5+ Problem Gambling **Two Assessments Later** in the LLLP.

	A1 → A3		A2 → A4	
	B	*p*	*B*	*p*
Gender (1=male; 2=female)	-1.29	.0013		
Age	-.03	.0319	.07	.0026
Non-Caucasian				
Educational Attainment				
Physical Functionality (higher = more function)	-.54	.0057	-1.87	.0000
Physical Health Rating			1.46	.0001
Big Win when 1st Started Gambling	.99	.0084	-1.10	.0937
Big Loss when 1st Started Gambling	3.44	.0000		
Parents Gambled with Person when Growing Up			-1.09	.0047
Parents were/are Regular Gamblers	1.88	.0000	1.31	.0310
Parents were/are Problem Gamblers	-2.66	.0001		
Siblings were/are Problem Gamblers				
Gambling Attitudes			.80	.0001
Lottery Frequency in Past Year			-.30	.0457
Instant Win Frequency in Past Year	-.98	.0000	.76	.0000
Bingo Frequency in Past Year	.99	.0000	1.39	.0006
EGM Frequency in Past Year	.90	.0000	1.08	.0000
Table Game Frequency in Past Year	1.78	.0000	1.05	.0000
Private games for $ in Past Year	-.38	.0072		
Sports Betting Frequency in Past Year	.50	.0028		
Horse Race Betting Frequency in Past Year				
High Risk Stock Frequency in Past Year				
Internet Gambling in Past Year	-2.94	.0004		
TOTAL NUMBER OF GAMBLING TYPES			-1.13	.0000
TOTAL GAMBLING EXPENDITURE				
Maximum Single Day Gambling Loss in Past Year				
TOTAL TIME SPENT GAMBLING			.01	.0001
% of Close Friends that Gamble Regularly			.07	.0000
Gambling Fallacies (lower = more fallacies)	-.92	.0000		
CPGI Category	1.88	.0001	6.16	.0000
NEO Vulnerability facet			.31	.0007
NEO Impulsivity facet	.23	.0000		
NEO Excitement Seeking	-.20	.0000	.15	.0261
NEO Agreeableness				
NEO Conscientiousness			.10	.0265
Life Events in Past Year				
Childhood Trauma	.07	.0000	-.09	.0011
Post-Traumatic Stress	-.18	.0035		
Depression	-.19	.0000	.12	.0024

	A1 → A3		A2 → A4	
	B	*p*	*B*	*p*
Anxiety	.17	.0000	-.14	.0013
Panic Attacks				
Agoraphobia				
Obsessive Compulsive Disorder	-.13	.0337		
ADHD			.40	.0406
Tobacco User	2.19	.0000	1.28	.0207
Alcohol Use Status			4.80	.0000
Illicit Drug User			-2.22	.0043
Alcohol Dependence			-2.72	.0061
Drug Dependence	-5.18	.0015		
Social Support (0=isolated; 3=not isolated)				
Family Functioning			-.09	.0037
Community Quality				
Antisociality Score				
Intelligence				

Table 26. Variables Predicting CPGI 5+ Problem Gambling **Three Assessments Later** in the LLLP.

	A1 → A4		A1a → A4a		A1b → A4b	
	B	*p*	*B*	*p*	*B*	*p*
Gender (1=male; 2=female)						
Age						
Non-Caucasian			3.56	.0005	3.54	.0000
Educational Attainment	.90	.0200				
Physical Functionality (higher = more function)						
Physical Health Rating	-1.08	.0000	-1.77	.0001		
Big Win when 1st Started Gambling	-1.69	.0009				
Big Loss when 1st Started Gambling						
Parents Gambled with Person when Growing Up			-1.71	.0024	3.81	.0000
Parents were/are Regular Gamblers	3.22	.0000	5.94	.0000	1.09	.0087
Parents were/are Problem Gamblers						
Siblings were/are Problem Gamblers	2.16	.0023	5.06	.0002	4.04	.0000
Gambling Attitudes						
Lottery Frequency in Past Year	.46	.0001			.35	.0045
Instant Win Frequency in Past Year			-.66	.0080		
Bingo Frequency in Past Year	1.06	.0000	1.30	.0002	.86	.0002
EGM Frequency in Past Year	.54	.0001	.80	.0005	.71	.0000
Table Game Frequency in Past Year	2.08	.0000	1.50	.0004	1.19	.0000
Private games for $ in Past Year	.61	.0000				
Sports Betting Frequency in Past Year			.59	.0229	.43	.0324
Horse Race Betting Frequency in Past Year						
High Risk Stock Frequency in Past Year						
Internet Gambling in Past Year						
TOTAL NUMBER OF GAMBLING TYPES	.11	.4200				
TOTAL GAMBLING EXPENDITURE						
Maximum Single Day Gambling Loss in Past Year						
TOTAL TIME SPENT GAMBLING					.01	.0003
% of Close Friends that Gamble Regularly			.04	.0010	.03	.0003
Gambling Fallacies (lower = more fallacies)	-.99	.0000	-1.67	.0000	-.90	.0000
CPGI Category						
NEO Vulnerability facet						
NEO Impulsivity facet						
NEO Excitement Seeking						
NEO Agreeableness						
NEO Conscientiousness	-.07	.0217				
Life Events in Past Year	-.19	.0000			-.32	.0000
Childhood Trauma						
Post-Traumatic Stress						
Depression	.15	.0000	.14	.0041	.11	.0030

	A1 → A4		A1a → A4a		A1b → A4b	
	B	*p*	*B*	*p*	*B*	*p*
Anxiety	-.13	.0000				
Panic Attacks	2.40	.0004				
Agoraphobia						
Obsessive Compulsive Disorder	.20	.0009				
ADHD			1.27	.0983		
Tobacco User	.86	.0542				
Alcohol Use Status	3.58	.0000				
Illicit Drug User						
Alcohol Dependence						
Drug Dependence						
Social Support (0=isolated; 3=not isolated)						
Family Functioning						
Community Quality	1.03	.0000			.91	.0004
Antisociality Score	-.10	.0000				
Intelligence						

Summary of Multivariate Findings from the Logistic Regressions

Table 27 displays the importance of variables as multivariate predictors of future problem gambling in both the QLS and LLLP datasets. Blue (QLS) and purple (LLLP) highlighting identifies variables that were consistent predictors within each time period as established by being a statistically significant variable in the stepwise logistic regressions in the majority of comparisons (and with the same direction of effect in each case). 'Majority of comparisons' means 3/4 when there were 4 within a time interval; 2/3 when there were 3 within a time interval; and 2/2 when there were 2 within a time interval. The variable needed to be significant for *all* comparisons when the comparisons involved random subsamples of the same data. When a variable was not assessed in the dataset it is denoted by '—'.

Table 27. Consistent **Multivariate Predictors** of Future Problem Gambling for Each Time Interval in QLS and LLLP.

	1 Assessment Later		2 Assessments Later		3 Assessments Later		4 Assessments Later
	QLS	LLLP	QLS	LLLP	QLS	LLLP	QLS
DEMOGRAPHICS							
Male					▓		
Younger Age							
Non-Caucasian			▓				
Lower Educational Attainment							
PHYSICAL HEALTH							
Physical disability				▓			
Lower physical health rating							
GAMBLING							
Gambling Attitudes (less positive)	▓		▓				
Lack of a big win prior to 19 (QLS); Big win when 1st started gambling (LLLP)			▓		▓		▓
Parents/sibs regular gamblers when person growing up; &/or currently (LLLP)		▓		▓		▓	
Parents or sibs gambled with person when growing up; parents only (LLLP)							
Parents/sibs problem gamblers when person growing up; &/or currently (LLLP)						▓	
Lottery ticket frequency							
Instant win ticket frequency	▓		▓				
Bingo frequency		▓		▓		▓	
EGM frequency	▓	▓		▓	▓	▓	▓
Casino table game frequency		▓	▓	▓		▓	
Social games of skill frequency; Private games for $ (LLLP)							
Sports betting frequency		▓					
Horse or dog racing frequency							
High risk stock frequency	▓		▓		▓		
Gambled on Internet	▓		▓				
TOTAL NUMBER OF GAMBLING TYPES ENGAGED IN	▓	▓					
TOTAL GAMBLING EXPENDITURE	▓						
Largest single day loss							

LIFETIME GAMBLING (rows: Lack of a big win; Parents/sibs regular gamblers; Parents or sibs gambled with person; Parents/sibs problem gamblers)

PAST YEAR GAMBLING (rows: Lottery ticket frequency through Largest single day loss)

		1 Assessment Later		2 Assessments Later		3 Assessments Later		4 Assessments Later
		QLS	LLLP	QLS	LLLP	QLS	LLLP	QLS
PAST YEAR GAMBLING	Largest single day win		--		--		--	
	TOTAL TIME SPENT GAMBLING	--		--		--		--
	PPGM (QLS) or CPGI (LLLP) GAMBLING CATEGORY							
GAMBLING MOTIVATION	Not for Excitement/entertainment/fun		--		--		--	
	To win money		--		--		--	
	Escape/distraction (QLS); dissociation while gambling (LLLP)		--		--		--	
	To socialize		--		--		--	
	Not to support worthy causes		--		--		--	
	Not to feel good about self		--		--		--	
	Other motivation		--		--		--	
GAMBLING EXPOSURE	# close friends/family regular gamblers (friends only in LLLP)							
	# of close friends and family with gambling problems		--		--		--	
	Distance (km) to nearest EGM venue		--		--		--	
	Gambling Fallacies							
PERSONALITY								
	Vulnerability (lower)							
	Impulsivity (higher)							
	Excitement Seeking (lower)							
	Agreeableness (lower)							
	Conscientiousness (lower)							
STRESS								
	Number of stressful life events in past year							
WELL BEING	Stress level (higher)		--		--		--	
	Happiness level (lower)		--		--		--	
	Abused as a child							
	Other past trauma that still impacts today		--		--		--	
MENTAL HEALTH								
	Post-Traumatic Stress							
	Major Depressive Disorder							

		1 Assessment Later		2 Assessments Later		3 Assessments Later		4 Assessments Later
		QLS	LLLP	QLS	LLLP	QLS	LLLP	QLS
MENTAL DISORDERS	*Not* having Generalized Anxiety Disorder							
	Panic Attacks &/or Agoraphobia							
	Obsessive Compulsive Disorder							
	Eating Disorder							
	Attention Deficit Hyperactivity	--		--		--		--
	ANY MENTAL DISORDER		--		--		--	
SUBSTANCE USE, ABUSE, AND DEPENDENCE	Tobacco user in past year							
	Alcohol use in past year (QLS); Level of alcohol use in past year(LLLP)							
	Illicit drug use in past year							
	Substance abuse or dependence (QLS); drug dependence (LLLP)							
	Behavioural Addiction in past year		--		--		--	
LIFETIME MENTAL HEALTH (prior to past 12 months)	Lifetime history of addiction to drugs/alcohol		--		--		--	
	Lifetime history of behavioural addiction		--		--		--	
	Parents/siblings have history of addiction		--		--		--	
	Lifetime history of mental health problems		--		--		--	
	Parents/siblings have history of mental health problems		--		--		--	
SOCIAL FUNCTIONING								
SOCIAL FUNCTIONING AND SUPPORT	Social Support (lower)							
	Family functioning (lower)							
	Community quality & involvement (lower)							
RECREATION	Gambling is 1 of 5 favourite leisure activities		--		--		--	
ILLEGAL BEHAVIOUR AND ANTISOCIALITY	Number of Illegal activities in lifetime		--		--		--	
	Number of Illegal activities in past year		--		--		--	
	Antisociality							
COGNITIVE FUNCTIONING								
	Lower Intelligence							

Predictors of First Onset Problem Gambling

In any given assessment, problem gamblers fall into one of three groups: people who became problem gamblers for the very first time; problem gamblers who are continuing their problem gambling from the previous assessment; and relapsed problem gamblers. The analyses conducted thus far identify univariate and multivariate predictors of future problem gambling, regardless of whether it is first onset, relapsed problem gambling, or problem gambling continuation. Supplementary analysis was undertaken to better identify the specific etiological role of these predictive variables.

Appendix H presents the prior year independent variable profiles of people in QLS who became PPGM Problem Gamblers for the first time in the next assessment ('Became PG next A' group) compared to the prior year profile of people who remained Non-Problem gamblers in the next assessment ('Stayed NPG next A' group). The 'Became PG next A' group consists of participants who did not meet criteria for PPGM Problem or Pathological gambling in any previous year; i.e., they became problem gamblers for the first time during the study. Problem gamblers who reported a lifetime history of problem gambling were also excluded from this group, as were Problem Gamblers missing prior year data, and Problem Gamblers who were problem gamblers in any previous assessment. The 'Stayed NPG next A' group consisted of everyone who was a Non-Gambler, Recreational Gambler, or At Risk Gambler in the prior assessment and continued to be either a Non-Gambler, Recreational Gambler, or At Risk Gambler in the next assessment.

In addition to data for the 4 individual assessments, the *average profile* across the QLS assessment periods was created by weighting each year's data as a function of sample size (i.e., the number of people who became Problem Gamblers for the first time in Assessment 2 was 55, with 40 in Assessment 3, 27 in Assessment 4, and 12 in Assessment 5, for a total of 134. Hence, the Assessment 1 independent variable profile for the 55 people who became problem gamblers for the first time in Assessment 2 received a weight of 55/134 toward the average profile. These average values across the assessments were then subject to statistical testing. A *z* test of proportions was used for categorical variables to determine whether the average proportion for the 'Became PG next A' group differed significantly from the 'Stayed NPG in next A' group (*p* < .05, 2 tail test). A t-test as used in an analogous manner for the continuous variables. Significant differences are denoted by blue shading.[28]

Appendix I documents the prior year independent variable profiles of people in LLLP who became CPGI 5+ Problem Gamblers for the first time in the next assessment ('Became PG next Assessment' group) compared to the prior year profile of people who remained Non-Problem gamblers in the next assessment ('Stayed NPG next Assessment' group). Variables not assessed or not available are denoted by '—'. In addition to data for the 3 individual assessments, the *average profile* across the LLLP assessment periods has been created by weighting each year's data as a function of sample size. A z test of proportions was then applied to categorical

[28] Because there is some degree of movement between gambling category membership over time, the *averaged groups* are not totally independent (a requirement of these statistical tests). Thus, statistical significance must be regarded with some caution.

variables to determine whether the average proportion for the 'Became PG next Assessment' group differed significantly from the average proportion for the 'Stayed NPG next Assessment' group. An independent group t-test was used in an analogous manner for the continuous variables. Significant differences between the groups are denoted by purple shading.

Table 28 summarizes the findings of Appendices H and I.

Table 28. Univariate **First Onset** Predictors of Problem Gambling in QLS and LLLP.

Legend: *p < .05 (2 tail)* (light blue); *p < .01 (2 tail)* (blue); *p < .05 (2 tail)* (light purple); *p < .01 (2 tail)* (purple)

	QLS Predictors	LLLP Predictors
DEMOGRAPHICS		
Male		
Younger Age		
Immigrant		
Non-Caucasian	p<.05	
Adopted	p<.05	
Lower Educational Attainment	p<.05	
Marital Status (separated or not married)		
Employment Status (on leave or on strike)		
Household Income		
Household Debt		
Geographical Location	--	
PHYSICAL HEALTH		
Physical disability		
Lower physical health rating		
Taking prescription medication		
GAMBLING		
Gambling Attitudes (less positive)		
LIFETIME GAMBLING — Age first gambled		
Frequency of gambling prior to 19		--
Big win prior to 19 (QLS); Big win when 1st started gambling (LLLP)		p<.01
Big loss prior to 19 (QLS); Big loss when 1st started gambling (LLLP)		
Big win and big loss prior to 19		--
Parents or sibs regular gamblers when person growing up (QLS); Parents or sibs do/did gamble regularly (LLLP)		p<.01
Parents or sibs gambled with person when growing up (QLS); (parents only in LLLP)		
Parents or sibs problem gamblers when person growing up (QLS); Parents or sibs are/were problem gamblers (LLLP)	p<.05	
Largest single day loss ever		
Largest single day win ever		--
Lifetime net win/loss		--
PAST YEAR GAMBLING — Lottery ticket frequency	p<.01	
Raffle ticket frequency	--	
Instant win ticket frequency	p<.01	p<.05
Bingo frequency	p<.01	p<.05
EGM frequency	p<.01	p<.01
Casino table game frequency	p<.01	p<.01
Social games of skill frequency (QLS); Private games for $ frequency (LLLP)	p<.01	p<.01
Sports betting frequency	p<.05	
Horse or dog racing frequency		
High risk stock frequency	p<.05	
Out-of-province casino frequency	--	
FREQUENCY OF ALL FORMS COMBINED	p<.01	p<.01
Gambled on Internet	p<.01	
TOTAL NUMBER OF GAMBLING TYPES ENGAGED IN	p<.01	p<.01
Lottery ticket expenditure		
Raffle ticket expenditure	--	
Instant win ticket expenditure		p<.01
Bingo expenditure		
EGM expenditure		p<.01
Casino table game expenditure		p<.05
Social games of skill expenditure		
Sports betting expenditure	p<.01	

			QLS Predictors	LLLP Predictors
		p < .05 (2 tail); *p < .01 (2 tail);* *p < .05 (2 tail);* *p < .01 (2 tail)*		
		Horse or dog racing expenditure		
		High risk stock expenditure		
		Out-of-province casino expenditure	--	
		EXPENDITURE ON ALL TYPES COMBINED (category)		
		Largest single day loss (category)		--
		Largest single day win (category)		--
		TOTAL TIME SPENT GAMBLING	--	
		Membership in gambling rewards program		--
		Higher frequency of ATM use in gambling venues		--
GAMBLING MOTIVATION		Excitement/entertainment/fun		
		To win money		
		Escape/distraction (QLS); dissociation while gambling (LLLP)		
		To socialize		
		To support worthy causes		--
		To feel good about self		--
		Other motivation		--
GAMBLING CONTEXT (past year)		Gambling alone rather than with friends		--
		Drink alcohol when gambling (QLS); Alcohol/drugs when gambling (LLLP)		
		Use tobacco when gambling		--
		Use [street] drugs when gambling (QLS); Alcohol/drugs when gambling (LLLP)		
GAMBLING SOCIAL EXPOSURE		# close friends/family regular gamblers (friends only in LLLP)		
		# of close friends and family with gambling problems		--
		Other adults in household with gambling problems		--
GAMBLING EXPOSURE		Opportunities to gamble at workplace or school		
		Had prevention/awareness campaign at work or school		--
		Gambling Fallacies		
GAMBLING AVAILABILITY		Driving time (minutes) to nearest EGM venue		--
		Distance (km) to nearest EGM venue		
		Participant estimate of distance to nearest EGM venue		--
		Casino/racino density	--	
PERSONALITY				
		Neuroticism (higher)		
		Depression (higher)		
		Vulnerability (higher)		
		Impulsivity (higher)		
		Extraversion		
		Excitement-seeking (higher)		
		Openness		
		Agreeableness (lower)		
		Conscientiousness (lower)		
STRESS				
		Number of stressful life events in past year		
WELL BEING		Stress level (higher)		
		Happiness level (lower)		
		Life satisfaction (lower)		
		Personal Wellness Index (lower)		
		Abused as a child		
		Other past trauma that still impacts today		--
VALUES				
Most important in life		Money		--
		Power		--
		Fame		--
		Friendships		--
		None of the above		--
		Wealth indicates success (lower endorsement)		--

			p < .05 (2 tail); *p < .01 (2 tail);* *p < .05 (2 tail);* *p < .01 (2 tail)*	QLS Predictors	LLLP Predictors
MENTAL HEALTH					
MENTAL DISORDERS			Post-Traumatic Stress		--
			Major Depressive Disorder	[shaded]	
			Suicidal Ideation	--	
			Mania		
			Generalized Anxiety Disorder		
			Panic Attacks &/or Agoraphobia		
			Social Phobia	--	
			Specific Phobias	--	
			Somatic Complaints	--	
			Paranoia	--	[shaded]
			Borderline Features	--	
			Aggression	--	
			Obsessive Compulsive Disorder		
			Eating Disorder		
			Schizophrenic or Delusional Disorder		
			Attention Deficit Hyperactivity	--	
			ANY MENTAL HEALTH PROBLEM	[shaded]	--
SUBSTANCE USE, ABUSE, AND DEPENDENCE			Tobacco user	[shaded]	
			Alcohol use (QLS); Level of alcohol use (LLLP)		
			Illicit Drug use		
			≥ Weekly use of tobacco, alcohol, illicit drugs or nonmedical use of licit drugs		--
			Substance abuse or dependence (QLS); drug dependence (LLLP)	[shaded]	
			Behavioural Addiction	[shaded]	--
LIFETIME MENTAL HEALTH (prior to past 12 months)			Lifetime history of addiction to drugs/alcohol		--
			Lifetime history of behavioural addiction		--
			Parents/siblings have history of addiction		--
			Lifetime history of mental health problems		--
			Parents/siblings have history of mental health problems		--
SOCIAL FUNCTIONING					
			Heterosexual		
SOCIAL FUNCTIONING AND SUPPORT			Marital Satisfaction (lower)		
			Social Support (lower)		
			Family functioning (lower)		
			Community quality & involvement (lower)		
RELIGION			Religious Affiliation		
			Religiosity		
RECREATIONAL ACTIVITIES			Gambling is 1 of 5 favourite leisure activities	[shaded]	--
			Gambling is favourite leisure activity		--
OCCUPATIONAL FUNCTIONING			Job stress		--
			Job satisfaction		--
ILLEGAL BEHAVIOUR AND ANTISOCIALITY			Number of Illegal activities in lifetime		
			Number of Illegal activities in past year		--
			Antisociality		
COGNITIVE FUNCTIONING					
			Lower Intelligence		
			Wisconsin Card Sorting Test	--	

Self-Perception of the Cause(s) of Problem Gambling in the QLS

In the QLS, whenever someone obtained a score of 3 or more on the CPGI they were automatically prompted with an open-ended question "What would you say has caused your gambling problems?" The CPGI was used rather than the PPGM, as the scoring algorithms for the PPGM were much more complicated to program. A CPGI 3+ demarcation was used rather than 5+ so as to cast a wide net to better ensure that everyone who would later be designated as a PPGM Problem/Pathological Gambler would have been asked this question. The responses for all individuals subsequently designated as a Problem or Pathological Gambler on the PPGM were collected and are reported verbatim in Appendix J. Some answers are edited to preserve anonymity. For the purposes of comparison with the quantitative results just described (which look at behaviour in Assessments 2, 3, 4, and 5 as a function of earlier behaviour), only the open-ended responses from Assessments 2 to Assessment 5 are reported.

Although a response to this question was not mandatory, most people did provide one. Of the 113 PPGM Problem Gamblers in Assessment 2, 100 provided a written answer, with the proportions in subsequent assessments being 88/103 in Assessment 3, 92/104 in Assessment 4, and 73/77 in Assessment 5.

These open-ended written responses had a few distinctive characteristics. For one, they tended to be short, with a phrase or sentence being the most common length, and only a few people providing multi-sentence responses. However, in most cases this appeared to be due to a relatively simple and singular belief about the cause(s) of their gambling problems that did not require elaboration. As an indication of this, of the 292 people who did provide explanations about what caused their gambling problems, 77.4% only reported a single cause, with 19.2% identifying 2 causes, 3.4% identifying 3 causes, and no one identifying 4 or more causes.

Table 29 below groups these reported causes into themes. The 4 most common themes were: the desire to win money (contained in 18.8% of the responses); to relieve boredom or for the excitement of gambling (15.1% of responses); because of stress, depression, or the need to escape (12.5% of responses); and the ready availability of gambling (10.6%). It is notable that 10.8% of people denied having gambling problems at all and another 6.5% reported they did not know the causes of their gambling problems. Less common themes concerned the fact that the person was an addict or had an addictive personality (6.0%), 'losing' (4.6%), social pressure or enjoying the social aspect of gambling (4.3%); and chasing losses (2.6%).

Table 29. Frequency of Self-Reported Causes of Problem Gambling among PPGM Problem Gamblers in QLS.

	Assessment 2	Assessment 3	Assessment 4	Assessment 5	TOTAL	%
Desire to Win Money	25	23	11	19	78	18.8%
Boredom/Excitement	18	20	4	21	63	15.1%
Stress/Depression/Escape	14	12	15	11	52	12.5%
Denial of Problem	21	10	8	6	45	10.8%
Availability of Gambling	13	4	24	3	44	10.6%
Don't Know	6	5	8	8	27	6.5%
Addiction	7	8	5	5	25	6.0%
Losing	4	4	7	4	19	4.6%
Social Pressure	3	4	7	4	18	4.3%
Chasing Losses	3	3	4	1	11	2.6%
Other	5	12	12	5	34	8.2%
TOTAL	119	105	105	87	416	

Figures in the cells indicate the number of people reporting this reason during that assessment period.

Subgroup Analysis

The results thus far show there to be a large number of different variables etiologically related to problem gambling at a group level. Informal examination of individual problem gamblers shows that different problem gamblers have different patterns of these variables, as well as a few other variables not implicated for the group as a whole. There are likely certain patterns of variables that are more common than other patterns as a function of age, gender, ethnicity, or other groupings, as has been documented in previous research (Beaver et al., 2010; Kong, et al., 2014; Ledgerwood & Petry, 2006, 2010; Nower et al., 2013; Suomi, Dowling & Jackson, 2014). However, the identification of these cross-sectional groupings was not undertaken in the present study due to its focus on longitudinal change.

Different types of problem gamblers will also have different patterns of progression and remission (e.g., Blaszczynski & Nower, 2002). Slow versus fast onset, long versus short duration, and chronic versus single episode are the main variants. There would be value in determining whether there are reliable differences in the characteristics of people having these different patterns and whether different age, gender and other demographic grouping tend to have different trajectories. (Note: one of the characteristics predictive of different trajectories has already been identified in the Stability of Gambling and Problem Gambling section, with people having more severe forms of problem gambling (pathological gambling), tending to have a more chronic course).

Further research in this area is warranted (not undertaken in the present study).

DISCUSSION

The QLS had 4 primary research questions. The findings for each of these questions will now be summarized and discussed.

Stability of Gambling and Problem Gambling

Non-Gamblers have moderately high levels of stability with the slight majority continuing to be non-gamblers continuously over a 5 year period. However, it is also not uncommon for Non-Gamblers to transition in and out of Recreational Gambling (which in many cases only involves the person purchasing the occasional lottery ticket). During the 5 year period of observation, it was rare for Non-Gamblers to directly transition into At Risk or Problem Gambling or to ever become Problem Gamblers (occurring in only about 1% of cases).

Recreational Gamblers have very high levels of stability, with the large majority (70) being Recreational Gamblers continuously throughout the study, although a small percentage eventually transitioned into Non-Gambling (13%) or At Risk Gambling (10%). Approximately 5% of Recreational Gamblers in QLS Assessment 1 became Problem Gamblers at some point in the subsequent 4 years. Because recreational gamblers constitute the large majority of gamblers in all jurisdictions, this also means that at a population level gambling behaviour is quite stable (depending on the time period in the QLS between 75.5% and 78.5% of the population were Recreational Gamblers).

At Risk Gamblers have fairly high levels of *instability,* with only 37% of people in the PPGM At Risk category in Assessment 1 continuing in this category in Assessment 2 and only 6.7% continuing in this category throughout the study. To some extent this is to be expected, as people in this category are theoretically in a transitional state between recreational and problem gambling. It is also worth noting that while 14.7% of people in the At Risk category eventually went on to become Problem Gamblers, the large majority of people in the At Risk category transitioned back to Recreational Gambling.[29]

Problem Gamblers tend to have levels of instability similar to At Risk Gamblers. Roughly half of problem gamblers were observed to be problem gamblers in only one time period. One year was the modal duration of problem gambling for both instruments and both datasets, with 2 years being the next most common duration. Duration also speaks to chronicity. Thus, chronic

---

[29] Considering the relatively low rate of conversion to problem gambling this category might be better described as 'Sub-Clinical Problem Gambling' rather than 'At Risk Gambling'. Alternatively, the scoring criteria could be adjusted to produce a better yield of subsequent problem gamblers. This could be done by adding one or more variables demonstrated to have additive predictive power in the present study: past history of problem gambling; higher frequency of involvement in EGMs and/or casino table games; having family members and/or close friends that are regular or problem gamblers; having a big gambling win in the past year; higher levels of gambling fallacies; using gambling as a way of escaping from problems; and having a history of impulsivity.

unremitting problem gambling is also fairly uncommon, with only 6.4% of QLS problem gamblers being problem gamblers in 3 consecutive time periods, 5.5% in 4 consecutive years, and 8.1% in all 5 time periods. Risk of chronic unremitting problem gambling tends to increase to some extent with each consecutive year of problem gambling status.

Related to the above findings, recovery rates for problem gambling tend to be fairly high, with approximately 80% of problem gamblers having at least one year of recovery in a 5 year period. Recovery rates decrease with consecutive years of problem gambling. Only about 37% of people recovered in the year following 2 consecutive years of problem gambling, 20% recovered in the year following 3 consecutive years, and 25% in the year following 4 consecutive years.

Short-term relapse rates following recovery tend to be fairly low. Of those that recover, only about 25% relapse in the year following the recovery year, with this relapse rate increasing to about 30% within 2 years and 40% within 3 years. The longer term relapse rate is much higher, but cannot be quantified with the relatively short time frames used in the existing data.

Related to the above findings, rapid cycling in and out of problem gambling is uncommon, with only between 4% and 14% of problem gamblers repeatedly cycling in and out of problem gambling in a 4-5 year time period (as defined by having at least 2 discrete periods of both problem gambling and non-problem gambling in this time frame).

PPGM Pathological and CPGI 8+ Severe Problem Gambling have similar patterns of episode duration, chronicity, recovery, relapse, and cycling to PPGM and CPGI 5+ Problem Gamblers when the definition of stability is that the person is still in a PPGM Pathological or CPGI 8+ category. To some extent this is due to overlap in the samples, as about one-third of the problem gambler group have scores in the pathological range (i.e., 88/236 of the QLS PPGM Problem/Pathological gamblers score in the Pathological range, 84/226 of the QLS CPGI 5+ individuals have a score of CPGI 8+, and 21/57 of the LLLP CPGI 5+ have a score of CPGI 8+).

Because a significant percentage of pathological gamblers move into problem gambling rather than full recovery, it is also important to examine the stability of disordered gambling (i.e., either pathological *or* problem) among people who received a designation of pathological gambling at some point. When this criterion is used, a more chronic and stable course is evident. Now only about 27% of individuals have a problem/pathological duration of just one year, with a 2 year and 5 year duration being almost as common. In addition, only about 65% of individuals have at least one year of recovery, and the rates of recovery following consecutive years of problem or pathological gambling are somewhat lower. Finally, the rates of relapse are also somewhat higher and the rates of cycling are somewhat lower. In contrast to the relatively weak predictive validity of the PPGM At Risk category, it appears that PPGM Pathological Gambling and CPGI Severe Problem Gambling have good predictive validity and are therefore distinctions within the general category of problem gambling that should be maintained.

Comparisons with Previous Research

The present findings are consistent with what has been found in the 14 previously described studies examining the stability of gambling and/or problem gambling. All these studies also found recreational gambling to be very stable over time and non-gambling to be moderately stable. Considering that recreational gambling and non-gambling constitute the largest categories of gambling in every population prevalence study (Williams, Volberg & Stevens, 2012) [30], this also means that gambling behaviour will be fairly stable in the general population over time in all countries (even though most of these 14 longitudinal studies did not extrapolate their findings to the general population). The present results concerning problem gambling are also very consistent with prior research with regards to this category being fairly unstable, chronic unremitting problem gambling being uncommon, and with 1 year being a typical episode duration.

One area of divergence is that most prior longitudinal studies have found At Risk categories of gamblers to have the highest level of instability (as reported in Hofmeyr et al., 2011; Kairouz et al., 2012; Billi et al., 2014; Wiebe et al., 2003) whereas the present results indicate that PPGM At Risk gamblers tend to have similar levels of instability as PPGM Problem Gamblers. There are 2 likely reasons for this difference. First, all of these prior studies used the CPGI rather than the PPGM, as well as the traditional CPGI categorizations of Low Risk (CPGI = 1 to 2) and Moderate Risk (CPGI = 3 to 7). Because these CPGI Risk categories have narrow score ranges compared to the CPGI Problem Gambling category (CPGI = 8 to 27), small score changes are more likely to result in a category change. This problem is compounded by the random score changes from one assessment to another that occur due to measurement error and the fact that these prior studies did not make adjustments for this measurement error (e.g., by applying the Reliable Change Index).

Of final note, while the application of the Reliable Change Index better assures that changes from one period to another represent real changes, it is also a relatively blunt approach to address the problem of measurement error in that it applies the same group-derived RCI value to all individuals, despite the fact that there will be widely divergent individual levels of error. For example, it is reasonable to expect that some people will have a more accurate perception of their behaviour compared to others and that people in certain gambling categories will have less measurement error than people in other categories [31]. The point being made is that some of the instability seen at problem levels of gambling behaviour may still be attributable to

---

[30] The latest Alberta prevalence survey in 2009 showed 27% of the adult population to be non-gamblers; 63% to be recreational gamblers; 7% to be At Risk gamblers; and 2.5% to be problem gamblers (Williams, Belanger & Arthur, 2011). The latest Ontario prevalence survey in 2010/2011 showed 17% of the adult population to be non-gamblers; 74% to be recreational gamblers; 6% to be At Risk gamblers; and 2.2% to be problem gamblers (Williams & Volberg, 2013).

[31] For example, self-report is probably more accurate for someone who has never reported any problem gambling symptomatology (i.e., a recreational gambler) and then reports problems for the very first time compared to someone who has always reported varying levels of symptomatology.

residual error. The South African longitudinal study reported by Hofmeyr et al. (2011) sheds some light on this issue, as this study employed unusually short inter-assessment intervals of just a couple of months (6 assessments over 15 months), which should significantly reduce measurement error because of reduced memory demands. Reassuringly, these investigators found very similar levels of instability for Problem, At Risk, and Recreational gambling as has been found in other studies. On the other hand, if this level of instability truly exists in a 15 month time span, then using a past year time frame to assess problem gambling (as is standard) is probably not appropriate. Further research is needed to: a) clarify the relative importance of the various sources of measurement error (in addition to memory) in the assessment of problem gambling; b) identify ways to further minimize these sources of measurement error; and c) study the course of problem gambling using finer-grained chronology (e.g., monthly assessments) so as to ascertain whether a shorter time frame than the past year would be better to assess the presence or absence of problematic gambling behaviour.

Prediction of Future Problem Gambling

Univariate Predictors of Future Problem Gambling

The evidence indicates that there is no single variable that is overwhelmingly present in future problem gamblers and absent in people who do not become problem gamblers. Rather there are many different variables that each increase risk of future problem gambling, and are present to differing degrees in future problem gamblers. This biopsychosocial etiology is consistent with what has been found in other areas of addiction (Griffiths, 2005a; Griffiths & Delfabbro, 2001; Kumpfer, Trunnell & Whiteside, 1990; Marlatt et al., 1988; Sharpe, 2002; Wallace, 1993). Some of these variables are uncommon among future problem gamblers (e.g., gambling to escape), but when present, pose considerable risk. Other variables are common among future problem gamblers (e.g., gambling fallacies), but only modestly increase risk as it is a variable that also tends to be common amongst recreational gamblers.

That being said, there are some categories of variables and individual variables within these categories that are much stronger than others in predicting future problem gambling. In general, **gambling-related variables appear to be the category of variable most robustly predictive of future problem gambling** across both the QLS and LLLP datasets. Almost all of the strongest individual predictors are also within this category:

- **Current gambling category** is the single best predictor of future problem gambling. More specifically, future problem gambling is best predicted by currently being a problem gambler. To a lesser extent, it is predicted by being in the At Risk category. Current gambling category was the strongest individual predictor in the majority of logistic regressions and consistently predictive across almost all time intervals in both QLS and LLLP. Because current gambling category is not a 'first onset' predictor, this variable is primarily implicated in problem gambling continuation and relapse (something also found by Billi et al., 2014). The finding that current gambling category is strongly predictive of future

gambling category is very consistent with the results discussed in the *Stability of Gambling and Problem Gambling* section. It is also consistent with a general finding in behavioural research that predicting someone's future behaviour is best made on the basis of their present and past behaviour (e.g., Aarts, Verplanken & Knippenberg, 1998; Ouellette & Wood, 1998). Finally, it is consistent with the prior longitudinal findings of Abbott et al. (1999); Scherrer et al (2007) and Xian et al (2007); as well as the results of the Victorian Gambling Study (Billi et al., 2014), which are the only studies that appear to have included current gambling category as a predictor of future problem gambling.[32]

- **A big gambling win in the past year**. This was one of the strongest predictors in QLS. Although this was not directly assessed in LLLP, 'big win when first started to gamble' was assessed in LLLP and found to be a very strong predictor. It has been known for many years that a large portion of problem gamblers retrospectively report that a big gambling win escalated subsequent gambling behaviour (Billi et al., 2014; Lesieur & Custer, 1984; Turner et al., 2006, 2008). (Although the few laboratory studies have not found this effect: Kassinove & Schare, 2001; Weatherly, Sauter & King, 2004). As far as we are aware, the present study is the first prospective study to empirically support the contention that a big win in the previous year is a significant risk factor for problem gambling in subsequent years.

- **Intensity of overall gambling involvement** is the next strongest individual predictor, as measured by total expenditure on all gambling types, total frequency of gambling, total time spent on gambling, and total number of gambling formats engaged in. Although all 4 of these aggregate measures are very strongly predictive of future problem gambling, expenditure tended to be the strongest of the 4. It is fairly commonsensical that intensive and/or excessive involvement in gambling should routinely precede the onset of subsequent problem gambling, which is perhaps why it has not been studied extensively in prior longitudinal research. Nonetheless, overall level of gambling frequency was statistically linked to future problem gambling in the 2 studies that have specifically looked at this variable (Goudriaan et al., 2009; Romild, Volberg & Abbott, 2014).

- **Higher frequency of involvement in continuous forms of gambling.** The third strongest individual predictor across time periods and datasets was frequency of involvement in **electronic gambling machines**. Continuous forms of gambling with a higher frequency of play (and reinforcement) have consistently been linked to problem gambling (Williams, West & Simpson, 2012), as well as specifically in 2 prior longitudinal studies (Reith & Dobbie, 2011; 2013; Romild, Volberg & Abbott, 2014). Automated "electronic gambling machines (EGMs)" (i.e., slot machines, video lottery terminals (North America); fixed odds betting terminals, fruit machines (U.K.); pokies (Australia); pachinko (Japan); electronic bingo machines, etc.) epitomize continuous play and are the form of gambling most often identified by problem gamblers, treatment agencies, and gambling researchers in Western

---

[32] Most studies have likely presumed that current gambling category is predictive of future gambling category and have focused their efforts on identifying predictors other than this obvious one. However, as mentioned earlier, current gambling category was included as a predictor in the current study so as to determine a) how strong this variable is relative to other factors in predicting future problem gambling, and b) to determine which additional variables could contribute above and beyond existing gambling status to predict future problem gambling.

countries as creating the most problems (e.g., Dowling, Smith & Thomas, 2005; Brooks, Ellis & Lewis, 2008; Meyer, Hayer & Griffiths, 2009; Welte, Barnes, Wieczorek et al., 2007; Williams, Volberg & Stevens, 2012). **Casino table games** (e.g., baccarat, blackjack, roulette, craps) are another type of gambling with continuous play and a high frequency of reinforcement and was also a strong individual predictor in the present study. These games (particularly baccarat) are often identified as the most problematic form of gambling in Asian countries (Ka-Chio Fong & Orozio, 2005; Tang, Wu & Tang, 2007; Teo, Mythily, Anantha & Winslow, 2007; Wong & So, 2003; Williams, Volberg & Stevens, 2012) and also tend to have an elevated association with problems in Western countries (Welte et al., 2007; Williams, Volberg & Stevens, 2012). **Instant win tickets** could also be potentially categorized as a form of continuous gambling. This gambling format was also very strongly predictive of subsequent problem gambling across time periods and datasets in the present study.

- **Gambling being identified as a top 5 leisure activity.** This was one of the strongest predictors in QLS (not assessed in LLLP). Endorsement of gambling as a top 5 leisure activity (out of the 25 activities listed) is reflective of the attraction that gambling has for the person. QLS is the first study to examine the relationship between recreational pursuits and subsequent problem gambling and the first study to show that gambling as a favoured leisure pursuit was predictive of subsequent problem gambling. Identifying gambling as the person's *favorite* leisure pursuit was also predictive, but less so, as this option had such low endorsement.[33]

- **Family members and/or close friends that are either regular gamblers or problem gamblers**. There are several different variables in both QLS and LLLP that address this issue in different ways. Although the importance of these variables differs somewhat as a function of specific variable both within and between datasets, the general strength and consistency of these variables in predicting subsequent problem gambling is what makes them an important and cohesive group. The mechanism by which this type of variable impacts future problem gambling is presumably because having a gambling-involved social network both encourages gambling involvement as well as normalizing excessive involvement. In the case of family members it may also speak to a shared genetic predisposition to problem gambling (Eisen et al., 1998; Lobo & Kennedy, 2006, 2009; Shah et al., 2005; Slutske, Zhu et al., 2010). The present finding that having friends or family that are regular and/or problem gamblers is predictive of future problem gambling is consistent with the prior longitudinal research of Reith & Dobbie (2011, 2013); and Winters et al. (1995, 2002, 2005) as well as several previous correlational research studies (e.g., Hardoon, Gupta & Derevensky, 2004; Langhinrichsen-Rohling et al., 2004; Lesieur et al., 1991).

- **Motivation for engaging in gambling.** People who indicated their primary motivation for gambling was **to escape or to distract oneself** had significantly increased risk of future problem gambling. This motivation is illustrative of a poor coping mechanism that will typically lead to further stress and the further use of gambling to escape from this stress.

---

[33] Although gambling as a top 5 leisure pursuit is theoretically related to positive gambling attitudes and certain motivations for gambling (i.e., for fun/excitement), it actually had relatively weak correlations with both (r = .15 - .19). Rather, its strongest association was with total gambling frequency (r = .40).

This motivational variable has been previously identified as etiologically important both in the retrospective reports of problem gamblers (particularly female problem gamblers) and in several correlational studies (Blanco et al., 2006; Gupta & Derevensky, 1998; Ledgerwood & Petry, 2006; Li, 2007; Schull, 2002; Williams, Belanger & Arthur, 2011; Wood & Griffiths, 2007). We believe the present study is the first one to demonstrate the importance of this variable prospectively. Another motivation for gambling in the present study that was predictive of future problem gambling was gambling '**to win money**'.

- **Higher levels of gambling fallacies.**   Gambling fallacies have long been proposed to be etiologically important in the development of problem gambling (Delfabbro & Winefeld, 2000; Fong, Law & Lam, 2014; Fortune & Goodie, 2012; Gaboury & Ladouceur, 1989; Joukhador, Blaszczynski & Maccallum, 2004; Joukhador, Maccallum & Blaszczynski, 2003; Ladouceur & Sévigny, 2005; Ladouceur, Sylvain, Boutin et al., 2001; Miller & Currie, 2008; Ohtsuka & Chan, 2010; Toneatto et al., 1997; Wohl & Enzle, 2002, 2003a, 2003b). However, here again, the present study appears to be the first prospective investigation to empirically support this contention. It should also be noted that although people who became problem gamblers consistently had higher average levels of gambling fallacies, the magnitude of the difference with people who do not become problem gamblers was relatively small (i.e., 0.5 - 1 point on a 10 point scale) due to the fact that fairly high levels of gambling fallacies also exist in the general population.

- **Distance to nearest EGM Venue.** Prior research has documented small but significant within-jurisdiction associations between the availability of gambling and the prevalence of problem gambling (see Williams, West & Simpson, 2012 for a review). Furthermore, problem gambling prevalence rates have generally increased in the majority of studies that have examined the impact of the introduction of casinos (Williams, Rehm & Stevens, 2011). Thus, it comes as no surprise that EGM proximity was also a reliable univariate predictor of future problem gambling in QLS. Similar to gambling fallacies, although proximity to EGM venues is consistently a significant predictor, the magnitude of the association was consistently small. This is reflective of the fact that a) many future problem gamblers are not proximate to venues and many recreational gamblers are proximate; and b) research has found that the influence of gambling availability as a risk factor tends to diminish with time due to adaptation (LaPlante & Shaffer, 2007; Shaffer et al., 2004; Williams, Volberg & Stevens, 2012).

- **Internet gambling.** Online gambling was a consistently significant univariate predictor in QLS, but not LLLP. Prior research has documented a strong cross-sectional relationship between online gambling and problem gambling (see Wood, Williams & Parke, 2012 for a review). However, it requires longitudinal research to establish whether this is because problem gamblers typically add Internet gambling to their repertoire or because online gambling contributes to problem gambling. The present results indicate that both pathways occur, but that Internet gambling preceding problem gambling is the more common route. In QLS, 44% of people engaged in online gambling prior to becoming problem gamblers; 30% of people were problem gamblers who later engaged in online gambling; and 26% of people developed gambling problems in the same assessment year that they became problem gamblers. Internet gambling poses a risk for problem gambling presumably because it provides continuous forms of gambling as well as convenient 24 hour

accessibility (Williams, Wood & Parke, 2012a; 2012b). Romild, Volberg & Abbott (2014) is the only other longitudinal study to previously report online gambling to be related to future problem gambling.

Personality appears to be the next most important category of variable predictive of future problem gambling, with a few specific traits being particularly important:

- **Impulsivity** was not only the strongest personality predictor, but it was one of the strongest individual predictors across all categories of variables. Impulsivity has previously been related to future *gambling* in several prior longitudinal studies (Barnes et al., 1999, 2002, 2005; Cyders & Smith, 2008; Pagani et al, 2009) and future *problem gambling* in several others (Hofmeyr et al., 2011; Lee et al., 2011; Shenasse et al., 2012; Vitaro et al., 1996, 1997, 1999, 2001, 2004; Wanner et al., 2006, 2009). Multiple correlational studies have also documented a relationship (see MacLaren, Fugelsang, et al., 2011 for a review). (It was because of this strong association that pathological gambling was originally categorized as an Impulse-Control Disorder in the DSM-IV).

- Three other personality attributes also have strong and consistent predictive power, albeit not as strong as impulsivity: **vulnerability (to stress), lower agreeableness, and lower conscientiousness**. None of these personality traits have been studied in prior prospective research. However, higher levels of neuroticism (the main domain which vulnerability is a facet of), combined with lower agreeableness and lower conscientiousness have consistently been identified as a common personality profile of treatment-seeking problem gamblers (e.g., Bagby et al., 2007; Myrseth et al., 2009) as well as problem gamblers drawn from community samples (MacLaren, Best et al., 2011; MacLaren, Fugelsang et al., 2011). This triad of traits is also commonly found in substance abusers (Kotov et al., 2010).

The mental health area had several variables with reasonably strong predictive power across time intervals and datasets:

- **Depression.** Depression has been known to be a strong correlate of problem gambling for quite some time (Kim et al., 2006; Lorains, Cowlishaw & Thomas, 2011; Mood Disorders of Canada, 2004; Quigley et al., 2014). It is also the second most commonly identified predictor of future problem gambling in longitudinal research (Cunningham-Williams et al., 1998; Cottler & Cunningham-Williams, 1998; Hofmeyr et al., 2011; Lee et al., 2011; Ross & Hofmeyr, 2012; Scherrer et al., 2007; Shaffer & Hall, 2002; Slutske et al., 2005; Xian et al., 2007). In the present study it was the strongest predictor within the mental health category. The strength of this association may be due to shared genetic links with problem gambling (e.g., Lobo & Kennedy, 2009).

- **Having any mental health disorder** was also found to be a consistent predictor. However, what this variable was largely detecting was the presence of **Depression** and/or one of several *anxiety-related* disorders. **Post-Traumatic Stress, Generalized Anxiety, Panic Attacks and/or Agoraphobia, and Obsessive-Compulsive Disorder** were all independently found to be predictive of subsequent problem gambling to varying degrees. Anxiety-disorders are strong correlates of problem gambling (Lorains et al., 2011). However, only a few studies have investigated them in longitudinal research. These latter studies have also found them to be predictive (Billi et al., 2014; Hofmeyr et al., 2011; Ross & Hofmeyr, 2012;

Scherrer et al., 2007; Xian et al., 2007), although Scherrer et al. (2007) and Xian et al. (2007) did not find either generalized anxiety or panic disorder to be predictive. In addition to these anxiety-related disorders, the present study found that having a **Behavioural Addiction** (i.e., sex or pornography; exercise; shopping; Internet chat lines; video or Internet gaming; or over-eating) was consistently predictive. Although this association makes theoretical sense (as problem gambling is also a behavioural addiction), this finding should be considered tentative, as it has not been previously reported, the assessment instrument used (Behavioural Addiction Measure) has not yet been validated, and because of some uncertainty about whether behavioural addictions are valid clinical entities. A final predictive variable in this general category of mental health was **lifetime history of mental health problems,** which was a consistent predictor in certain time intervals in the QLS dataset.

- **Substance Abuse** was also a moderately strong and consistent univariate predictor, as was **tobacco use** (which in most cases would represent another form of substance abuse). This is not surprising, as nicotine dependence and substance abuse have been found to be the strongest comorbid conditions correlated with problem gambling (Grant, Kushner & Kim, 2002; Lorains et al., 2011; Petry, 2007). Having problems with alcohol has also been the most consistently identified predictor of problem gambling in prior longitudinal research (Abbott et al., 1999; Abbott, 2012; Cunningham-Williams et al., 1998; Cottler & Cunningham-Williams, 1998; Goudriaan et al., 2009; Parhami et al., 2014; Romild, Volberg & Abbott, 2014; Scholes-Balog et al., 2014; Vander Bilt et al., 2004). Tobacco use/abuse, has been identified as a predictor almost as often. The strong association of these variables to problem gambling is likely due to some shared vulnerability to addiction (e.g., Slutske, Eisen et al., 2000) as well as alcohol having a disinhibitory effect of gambling behaviour (Baron & Dickerson, 1999; Ellery, Stewart & Loba, 2005; Kyngdon & Dickerson, 1999). **Lifetime history of addiction to drugs/alcohol** was also a consistent predictor in certain time intervals in the QLS.

Within the category of cognitive ability:
- **Lower intellectual ability** was consistently predictive, but a stronger predictor in LLLP than QLS (potentially because of the more comprehensive assessment instrument used in LLLP). As the descriptive results illustrate, having an average or above average IQ does not confer much protection from becoming a problem gambler. However, people with below average IQs have significantly more risk. Lower IQ was a somewhat stronger predictor than l**ower educational attainment**, which, although a consistent predictor, was relatively weak compared to the other variables that have been described thus far. Less education and/or poor school performance has been linked to future problem gambling in 4 prior longitudinal studies (Billi et al., 2014; Scherrer et al., 2007; Scholes-Balog et al., 2014; Winters et al., 1995, 2002, 2005; Xian et al., 2007). As far as we are aware, there have been no prior studies examining the relationship between IQ and problem gambling. There have been a few studies linking lower IQ to greater likelihood of smoking (e.g., Modig et al., 2011), substance dependence (e.g., Kubicka et al., 2001), and certain mental disorders (Koenen et al., 2009), but the strength of these associations has not been strong.

Within the stress area:

- **Number of stressful life events in the past year** was moderately predictive (although less so in LLLP). This is another variable well established in both the correlational (Afifi et al., 2010a; Coman, Burrows & Evans, 1997; Turner, Zangeneh & Littman-Sharp, 2006) and longitudinal literature (Abbott, 2012; Goudriaan et al., 2009; Kairouz et al., 2012; Reith & Dobbie, 2011, 2013; Romild, Volberg & Abbott, 2014; Wiebe et al., 2003). Stress tends to impair judgement, promote the development of mental health problems, and can potentially also cause some people to use gambling as a way to escape from their stress.
- Other variables with moderate predictive power in this general category were **lower levels of happiness, higher levels of stress,** and **history of child abuse**. Happiness and stress have been previously identified as important in the context of depression and anxiety-related disorders. Child abuse has been identified as a correlate of problem gambling in studies of female problem gamblers receiving treatment (Petry & Steinberg, 2005; Specker et al., 1996). The association with child abuse in the present study was also reported in an earlier cross-sectional analysis of the LLLP data (Hodgins et al., 2010).

Within the social functioning area:

- **Antisociality** was a consistent and moderately strong predictor. This variable and/or conduct disorder are well established correlates of problem gambling (Crockford & el-Guebaly, 1998; Meyer & Fabian, 1991; Petry, Stinson & Grant, 2005; Vitaro et al., 2001), which may be due to shared genetic vulnerability (Slutske, Eisen et al., 2001). Antisociality and/or conduct disorder have also been linked to future problem gambling in 4 prior longitudinal studies (Cunningham-Williams et al., 1998; Cottler & Cunningham-Williams, 1998; Goudriaan et al., 2009; Scherrer et al., 2007; Winters et al., 1995, 2002, 2005; Xian et al., 2007).

Within the physical health area:

- **Having a physical disability** and/or **lower physical health rating** tended to have moderate predictive power. Poorer health has not commonly been examined in prior research, but has been linked to future problem gambling in a few correlational studies (e.g., Afifi et al., 2010b; Morasco & Petry, 2006) as well as in 2 of the more comprehensive longitudinal studies of gambling (Billi et al., 2014; Romild, Volberg & Abbott, 2014).

Comparisons with Previous Research

As evident from the above discussion, there is surprisingly high consistency between the results of the present study and previous research findings. Virtually all previously identified predictors of future problem gambling were also being shown to be significant predictors of future problem gambling in either QLS and/or LLLP. A few differences exist. Male gender, younger age, and gambling at an earlier age were expected to be significant predictors, but were not found to be in the present study.

Prior research has found male gender to be the strongest individual correlate of problem gambling, with males having higher rates in every population prevalence survey that has been conducted (including Alberta and Ontario) (Williams, Volberg & Stevens, 2012). In general, males are more prone to risk taking compared to females (Byrnes, Miller & Schafer, 1999), with the cross-cultural and cross-species nature of this difference suggesting a biological basis. As the nature of gambling involves risk, is not surprising that males should also have higher rates of gambling involvement and problem gambling. This higher rate of risk taking also leads to higher rates of substance use and abuse, which itself becomes a risk factor for problem gambling. Thus, it is clear that male gender is a risk factor for problem gambling and somewhat unclear why it was nonsignificant in the present study (although male gender was a consistent multivariate predictor of future problem gambling 3 assessments later in QLS (Table 27)). One possibility concerns differential attrition. Male gender was a characteristic of people who dropped out of both the QLS and LLLP studies, and problem gambling was a characteristic of people who dropped out in LLLP. Thus is seems quite possible that there was differential attrition of males having risk of future problem gambling in both studies.

Younger age has also been identified in population prevalence research to be one of the most consistent correlates of problem gambling (Williams, Volberg & Stevens, 2012), as well as being a well-established correlate of mental health disorders, substance abuse, and addictive behaviour more generally (Regier et al., 1988; Statistics Canada, 2013; SAMHSA, 2010). This is partly due to younger people engaging in risky behaviour to a greater extent. On the other hand, younger age has not actually been identified as a predictor of future problem gambling in longitudinal research. There has also been some suggestion that the cross-sectional findings with younger age may be due to a cohort effect and/or because younger age is correlated with other etiologically relevant variables such as impulsivity and higher levels of gambling involvement (Slutske, 2007). However, a cohort effect is unlikely as younger age is just as common a correlate of problem gambling in recent studies as it has been in older studies, including being a significant univariate correlate of problem gambling in both the most recent 2010/2011 Ontario (Williams & Volberg, 2013) and 2008 Alberta prevalence surveys (Williams, Belanger & Arthur, 2011). Although it is quite possible that the association with younger age in other studies is due to its correlation with more etiologically relevant variables, this was not the case in the present study as younger age was not correlated or predictive of problem gambling.

One other discrepancy is that gambling at an earlier age has been identified as a predictor of gambling by Delfabbro et al. (2009) and a predictor of problem gambling by Vitaro et al. (1996, 1997, 1999, 2001, 2004), Wanner et al. (2006, 2009), and Winters et al. (1995, 2002, 2005). However, in the present study neither reported first age of gambling or frequency of gambling prior to age 19 were significant predictors or correlates of problem gambling. However, supplemental multiple regressions conducted on the QLS data (not reported herein) identified gambling at a younger age to be one of the important predictors of future intensive gambling involvement (as measured by aggregate expenditure, frequency, and number of formats).

Thus, in the present study it would appear that gambling at a younger age may work indirectly through intensive gambling involvement to promote problem gambling. [34]

Multivariate Prediction of Future Problem Gambling

Multivariate analysis of future problem gambling was undertaken to determine which variables from the univariate analyses have overlapping versus unique predictive power and the extent to which the variables with unique predictive power can collectively predict future problem gambling.

Similar to the univariate results, the multivariate analyses found there to be many different variables that independently contribute to risk of future problem gambling (albeit significantly fewer than found in the univariate analyses). The multifaceted biopsychosocial etiology of problem gambling is demonstrated by the fact that even with the elimination of variables having redundant/overlapping predictive power there were 20 – 40 variables predictive of future problem gambling in each of the 16 stepwise logistic regressions.

Another important finding of the multivariate analyses is that collectively, these 20 – 40 variables were able to account for the large majority of the variance for each time period (ranging from 69% to 90%, with an average of 80%), and thereby potentially provide a comprehensive explanation of the different elements that contribute to the future onset of problem gambling.

As was found with the univariate analyses, there are both categories of multivariate predictors and individual multivariate predictors within these categories that are stronger and more consistent than others. Yet again, gambling-related variables contained the strongest and most consistent set of multivariate predictors**.**

Gambling category was once again the strongest individual predictor. However, many other strong univariate gambling predictors lost their predictive power in the multivariate analyses. This is particularly true of the aggregate measures of gambling involvement, which are not only strongly correlated with each other, but also other, even stronger predictors (i.e., current

---

[34] The variables determined to be robustly predictive of higher levels of future aggregate gambling expenditure, frequency, and number of formats in QLS were as follows (listed in order of importance): gambling for excitement/entertainment/fun, positive attitudes toward gambling, gambling being a favoured leisure activity, larger number of close friends and family members being regular gamblers, lower scores on the personality attribute of openness, higher frequency of gambling prior to age 19, older age (younger age being predictive of more gambling activities), higher excitement seeking, more gambling fallacies, less education, and lower intelligence. Note: Biggest gambling win in the past year was one of the strongest multivariate predictors for all measures of gambling involvement, but was excluded from the analysis as it is also reflective of level of gambling involvement (i.e., biggest gambling loss in the past year was also a fairly strong multivariate predictor). Antisociality was a strong univariate predictor for all measures of gambling involvement, but only a multivariate predictor for number of gambling types. Male gender was also a significant univariate predictor for all measures of gambling involvement, but not a multivariate predictor.

gambling category, big gambling win, frequency of gambling on continuous forms). Consequently, the predictive power of these aggregate measures was significantly diminished, with **engaging in a larger number of gambling formats** being the only aggregate measure providing unique and additive predictive power in both datasets (although aggregate spending provided additional predictive power in QLS). However, there were several gambling-related variables not redundant to each other and which did add predictive power. In order of importance they were: **having a big win in past year; EGM frequency; casino table game frequency; family members being regular gamblers; more close friends/family with gambling problems; gambling to escape or to win money; gambling fallacies; gambling being identified as a favourite leisure activity; and Internet gambling (QLS only)**.

Beyond these gambling-related variables, the only other variables robustly adding predictive power to the multivariate results were **impulsivity,** having a **behavioural addiction,** a **lifetime history of addiction to drugs or alcohol,** and a **family history of mental health problems**.[35]

Predictors of First Onset Problem Gambling versus Problem Gambling Relapse and Continuation

Comparison of the univariate predictors in Table 17 and the specific univariate first onset predictors of Table 28 suggests a pattern to variables that are first onset predictors and variables that are not. *Almost all gambling-related predictors (e.g., big win; aggregate time, money, frequency; friends/family regular or problem gamblers; etc.) tend to be first onset predictors.[36]* There are 2 important exceptions to this. One is current gambling category**,** which seems to be the most important variable involved in problem gambling continuation in the next assessment and relapse back to problem gambling once recovery has occurred. The other one is 'distance to the nearest EGM venue'. Although prior research has shown that gambling accessibility/proximity is typically correlated with problem gambling, its role in actually causing problem gambling, although usually positive, is less consistent (St-Pierre, Walker, Derevensky & Gupta, 2014; Williams, West & Volberg, 2012). The present result provides a potential explanation for this pattern: gambling proximity has a weak causal role in the initial

---

[35] The personality attributes of vulnerability, agreeableness, and conscientiousness lost their predictive power because of their significant correlations with impulsivity, as well as their correlation with gambling category and gambling fallacies to a lesser extent. Negative life events lost its predictive power to several different variables, including impulsivity, behavioural addiction, lifetime history of substance abuse, friends and family with gambling problems, family history of mental health problems, and gambling category. Depression and having any mental health problem lost their predictive power to impulsivity, lifetime history of substance abuse, family history of mental health problems, friends and family with gambling problems, and behavioural addiction. Tobacco use lost its predictive power to engaging in a larger number of gambling activities, gambling category, having a big win, and having a history of substance abuse. IQ lost its predictive power to gambling fallacies, gambling being a top leisure pursuit, EGM frequency, and gambling category.

[36] This includes additional gambling-related predictors that were not used in the main univariate and multivariate analyses: membership in a gambling rewards program, use of automatic teller machines (ATMs) in gambling venues, using tobacco while gambling, gambling alone rather than with friends.

development of problem gambling but is a significant precipitator for continuation in existing problem gamblers and relapse in former problem gamblers.[37]

In contrast to gambling-related variables, *many non-gambling variables tend to have a greater role in problem gambling continuation and relapse.* There are many important exceptions to this pattern, with impulsivity, major depression, tobacco use, behavioural addiction, stressful events, and lower educational attainment all also having roles in first onset problem gambling. Nonetheless, the general principle appears to be that the presence of certain personality traits (vulnerability, lower agreeableness, lower conscientiousness), as well as antisociality, comorbid mental health disorders, a lifetime history of mental health or substance abuse problems, lower intellectual ability, antisociality, and/or comorbid health problems makes it more difficult for problem gamblers to recover, and more susceptible to relapse once they have recovered.

Proximal versus Distal Predictors

Examination of Table 17 (and Table 27 to a lesser extent) indicates that *most predictors appear to create enduring risk for problem gambling at all time periods* rather than some predictors having distal or indirect impacts that take years to have their influence and some predictors having more direct and immediate impacts that have their influence in the next assessment.

Although there were no variables that *only* predicted problem gambling in the next assessment, certain variables are worth highlighting because they reliably preceded the appearance of problem gambling in the next assessment and were also significantly stronger predictors of imminent problem gambling than other variables (as determined by their Score statistic). The strongest and most consistent predictor of problem gambling in the next assessment was intensive gambling involvement, as measured by total gambling expenditure, total number of gambling types engaged in, frequency of involvement in individual types of gambling (particularly EGMs and instant lotteries), and total time spent gambling. Other strong and consistent predictors of imminent problem gambling were having a big gambling win in the past year and gambling being a top 5 leisure pursuit. The strongest and most consistent non-gambling related variables across both data sets were impulsivity and major depressive disorder.

Similarly, there were no variables that *only* predicted problem gambling several assessments later. That being said, any of the significant predictors that are invariant over time create a more distal risk: lower educational attainment, non-Caucasian, big win prior to 19, family being gamblers and/or problem gamblers when growing up, personality attributes (impulsivity, vulnerability, lower conscientiousness, lower agreeableness), child abuse, past trauma that still impacts currently, lifetime history of addiction to drugs/alcohol, family history of mental health problems, and lower intelligence.

---

[37] This is similar to gambling advertising, which has a weak 'first onset' role, but a significant role in relapse (Binde, 2007, 2009).

Relationship between Objective Predictors and Subjective Belief

There was modest overlap between problem gamblers' self-reports of what they believed the cause(s) of their problem gambling to be compared to the empirically identified predictors in the present study. It is important to remember that group results are being compared to each other and that there may be a better match between an individual's self-report and his/her objective individual predictors. However, the nature and magnitude of the differences suggests that individual report matching would likely not improve congruence to any great extent.

Most of the commonly reported causes of problem gambling did receive empirical validation: using gambling as a way to cope/escape and/or to win money, number of stressful events in past year, depression, gambling availability, and social pressure to gamble were all univariate and, in some cases, multivariate predictors. The only other commonly reported cause, gambling to relieve boredom and for the excitement, did not receive empirical support, largely due to the fact that this is also the most common reason for recreational gamblers to gamble.

The main divergence between self-report and objective predictors is what people failed to recognize and report. One obvious difference is the fact that 77.4% of self-reports focused on a singular cause, whereas it is clear from the present study that there are a considerable number of different variables that collectively contribute to the development of problem gambling. Another important difference is that self-reports tended to focus on psychological, motivational, and social influences with people being more oblivious to reasons related to their past personal or family history of gambling, gambling format they are engaging in, personality characteristics, lower educational attainment, big wins, physical health, and poorer mental health. That being said, there was some recognition of the potential role of certain environmental variables (i.e., availability of gambling; social pressure to gamble), and a small portion of people did report that the cause was due to having an addiction and/or an addictive personality.

In general, it seems that most problem gamblers have reasonable insight into the psychological determinants of their gambling problems, but more limited appreciation of the broader contextual determinants. It is possible that this limited insight may be an additional risk factor for developing problem gambling.

Etiological Model of Problem Gambling

The purpose of the present section is to outline an etiological model of problem gambling that emerges from the present results as well as incorporating pertinent findings from other studies. This could be attempted statistically using structural equation modelling. However, instead, a more theoretically-based model will be presented because of the large number of variables involved, the uncertain nature of the interaction between some of these variables, and because the statistical influence of 3 important variables (genetic inheritance, male gender, young age) could not be established with the existing data.

Biopsychosocial Etiology with Multiple Risk and Protective Factors

A biopsychosocial approach is central to all etiological models of addiction (Griffiths, 2005a; Griffiths & Delfabbro, 2001; Kumpfer, Trunnell & Whiteside, 1990; Marlatt et al., 1988; Sharpe, 2002; Wallace, 1993), including the present model. The present findings indicate that *problem gambling is caused by a large number of different risk factors from different domains*. Most problem gamblers have several of these risk factors, suggesting they act in an additive fashion to increase overall risk. The particular pattern of risk factors tends to be different between different problem gamblers, although most of the strongest risk factors are fairly prevalent. The pattern of risk factors within an individual is also not totally random. Rather, evidence tentatively indicates at least two main subtypes: the impulsive/antisocial pattern (often in males) versus the emotionally vulnerable pattern (often in females) (e.g., Blaszczynski & Nower, 2002; Windle & Scheidt, 2004). Although the emphasis of the present research has been on risk factors, it follows that not having a risk factor, or being on the other end of the continuum of a risk factor confers some protection against future problem gambling. Similarly, the greater number of protective factors someone has, the greater the likelihood that the person will always gamble in a responsible manner. These risk and protective factors interact in complex ways that are not always linearly additive or subtractive. They do have somewhat of an organizational and temporal sequence, however, as described below:

A Significant Proportion of Future Problem Gamblers have an Innate Propensity for Gambling, Problem Gambling, and Problem Gambling Comorbidities

Although self-report of a family history of gambling and/or problem gambling was an important predictive variable in the present study, this does not establish whether the relationship is due to modelling or genetic inheritance. Twin studies shed light on this, finding that 40-60% of the propensity for developing problem gambling can be predicted by genetic factors (Eisen et al., 1998; Lobo & Kennedy, 2006, 2009; Shah et al., 2005; Slutske, Zhu et al., 2010).[38] Although

---

[38] Although this figure may seem high to some people, it is very consistent with the heritability estimates of substance dependence, which ranges from 30% to 70% depending on the substance (Agrawal & Lynskey, 2008;

there is likely some gambling-specific genetic vulnerability, what people appear to be inheriting is a shared genetic vulnerability for several conditions including a) substance use and abuse; b) antisociality; and c) mood disorders (Eisen et al., 1998; Lobo & Kennedy, 2006, 2009; Shah et al., 2005; Slutske, Zhu et al., 2010).[39]

One of the behavioural manifestations of this inherited propensity is a decreased sensitivity to reward (Grant, Brewer & Potenza, 2006; Oberg, Christie & Tata, 2011; Reuter et al., 2005). This, in turn, creates an excitement-seeking orientation and a preference for risk-taking activities such as gambling, as well as greater future propensity for heavy gambling (Gibbs Van Brunschot, 2009; Parke, Griffiths & Irwing, 2004; Powell et al., 1999; Toneatto & Nguyen, 2007). Male gender and younger age are two additional attributes that increase propensity for risk taking (and gambling) independent of any specifically inherited propensity (Byrnes, Miller & Schafer, 1999).

Another behavioural manifestation of this inherited neurobiology is a stronger preference for immediate over delayed reward (Chambers & Potenza, 2003; Goudriaan et al., 2004; Oberg, Christie & Tata, 2011; Parke, Griffiths & Irwing, 2004; Petry & Madden, 2009; Shead, Callan & Hodgins, 2008; van Holst et al., 2010), which manifests itself as higher levels of impulsivity, which is an important direct risk factor for problem gambling (Lawrence et al., 2009; MacLaren, Fugelsang, et al., 2011; Nower & Blaszczynski, 2006; Skitch & Hodgins, 2004; Steel & Blaszczynski, 1998; Toneatto & Nguyen, 2007; Turner et al., 2008).

A greater propensity for risk taking and impulsivity is highly correlated with antisociality. These three attributes lead to higher rates of substance use and abuse. This, in turn, is a risk factor for stress and mental health problems (particularly mood disorders). Substance use/abuse, mental health problems, and stress are direct risk factors for problem gambling (primarily through facilitation of relapse and/or problem gambling continuation) as well as indirect risk factors by facilitating maladaptive motivations for gambling (i.e., gambling to escape). Problem gambling is also a contributing factor to mental health problems, substance abuse, and stress. This bidirectional relationship results in a high rate of co-occurrence of these conditions among problem gamblers.

Goldman et al., 2005) as well as the heritability estimates of the major psychiatric disorders, which range from 30 – 85% (Shih et al., 2004).

[39] This genetic inheritance appears to express itself neurologically by means of differential functioning of the ventral striatum/mesolimbic pathway ("reward pathway") (Buchel, 2006; Goodman, 2008; Goudriaan et al., 2004) as well as the ventromedial and dorsolateral regions of the prefrontal cortex (involved in executive functions and inhibition, among other things) (Chambers & Potenza, 2003; Dannon et al., 2011; Goudriaan et al., 2004; Grant, Brewer & Potenza, 2006; Meng et al., 2014; van Holst et al., 2010).

Environmental Factors have an Equally Important and More Universal Influence on Future Risk of Gambling and Problem Gambling

Environmental factors have an equally important role and more universal influence on the development of problem gambling. There are just as many environmental contributions to substance use/abuse, stress, antisociality, and mental health problems as there are endogenous contributions. Having an adverse childhood is one of the more important factors.

Parental or familial modelling of gambling and/or problem gambling are also important environmental contributors to both gambling and problem gambling by virtue of their normalization of these activities as well as introducing the person to gambling at a young age. Gambling at a young age is an important risk factor for future heavy gambling. Gambling involvement among one's peers and friends constitutes a similar risk factor for gambling involvement, heavy gambling involvement and potentially problem gambling.

Several other important environmentally-based risk factors exist. The most important ones appear to be: gambling being readily available, having more gambling fallacies, having less education, and having lower intelligence (intelligence also having a significant biological basis). All of these variables are direct risk factors for gambling, heavy gambling, and problem gambling. That being said, they tend to be stronger predictors of heavy gambling than problem gambling.

Heavy Gambling Involvement is the Greatest Direct Risk Factor for Problem Gambling

Heavy gambling involvement in terms of gambling expenditure, frequency of play, time spent, and/or number of formats engaged in is the final common pathway to problem gambling, occurring in virtually all future problem gamblers. Heavy gambling constitutes the strongest and most direct risk factor for problem gambling (in addition to sub-clinical levels of problem gambling). With heavy gambling involvement, operant and classical conditioning increase the frequency and strength of the behaviour and the physiological processes underlying it, making it progressively more difficult to willfully resist and accelerating progression to problem gambling (Petry, 2005; Skinner, 1953).

Engaging in continuous forms of gambling with a high frequency of reinforcement (e.g., EGMs, casino table games) is both a type of heavy gambling as well as an independent risk factor for future problem gambling. Heavy gambling also increases the likelihood of having a big gambling win, which independently serves as a very important risk factor for future problem gambling as well as future heavy gambling.

Problem gambling, in turn, creates risk for heavy gambling.

Recovery and Relapse are both Common

Recovery from problem gambling is common, with the modal duration of a problem gambling episode only being one year. However, even though recovery is common, propensity for relapse is very high. Past history of problem gambling is the strongest predictor of continued problem gambling as well as relapse after recovery. Other risk factors for relapse and continuation include the presence of certain personality traits (vulnerability, lower agreeableness, lower conscientiousness), antisociality, comorbid mental health disorders, a lifetime history of mental health or substance abuse problems, lower intellectual ability, antisociality, and/or physical health problems.

Figure 13 illustrates the etiological model described in the foregoing text. Arrow width conveys the approximate strength of each of the relationships.

145

Figure 13. Etiological Model of Gambling and Problem Gambling

Figure 13. Etiological Model of Gambling and Problem Gambling
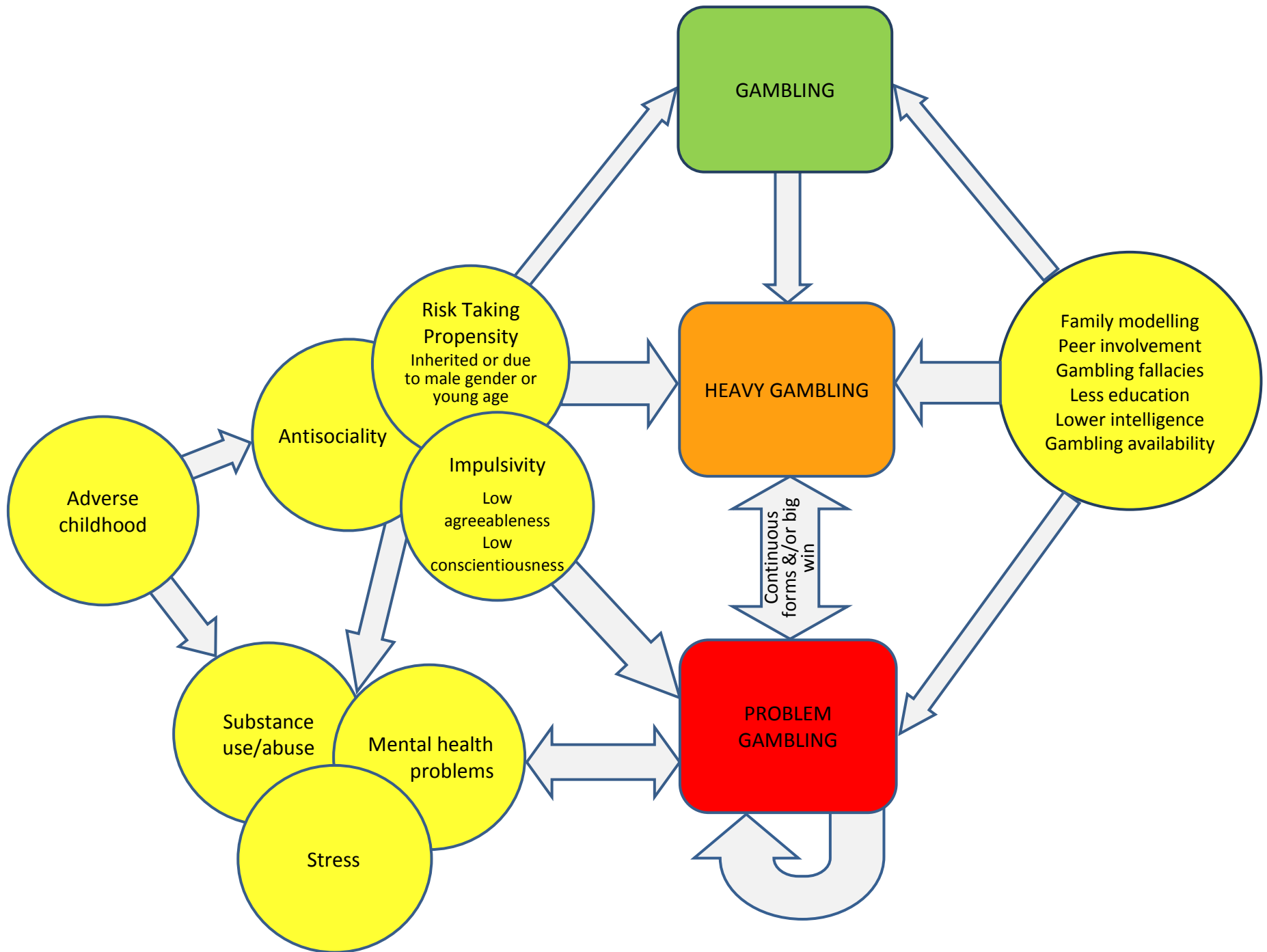
Implications for the Prevention of Problem Gambling

Previous Approaches for the Prevention of Problem Gambling Have a More Solid Scientific Footing

The present findings tend to confirm much of the previous research and speculation concerning the etiology of problem gambling. As such, their value tends to be not in identifying radically new approaches to prevention, but rather, in reaffirming much of what has already been advocated (e.g., Williams, West & Simpson, 2012) and providing a more scientifically solid footing for these recommendations.   The present findings also do suggest some fine-tuning of these approaches in light of having a better understanding of the relative importance of different variables and their specific etiological role.

Employ a Wide Array of Educational and Policy Initiatives and Coordinate these Efforts

There is no 'silver bullet' to prevent problem gambling. Rather, a wide array of educational and policy initiatives is needed to address the multi-faceted biopsychosocial etiology of problem gambling.

Evidence from allied fields demonstrates that effective prevention requires *coordination* between a wide range of effective educational strategies and effective policy measures targeting the same outcomes. Multiple prongs within a comprehensive and coordinated prevention strategy are often synergistic, with overlapping initiatives reinforcing the message and power of individual components (Nation et al., 2003; Stockwell et al., 2005). The effect is analogous to a shotgun blast, where the effect of any individual pellet is negligible, but when combined with other pellets aimed at the same target, can collectively have a major impact. To ensure synergistic coordination, it is often preferable to implement initiatives simultaneously rather than sequentially. The greater effectiveness of these more pervasive approaches has been demonstrated both in primary prevention (Durlak & Wells, 1997; Holder, 2005) and in the treatment of addictive behaviours (Jackson, Geddes, Haw & Frank, 2012; Miller, Wilbourne & Hettema, 2003; Winters et al., 2007).

Generic Prevention Programs Targeting a Wide Range of Problems is Needed

Part of the reason for the high rate of problem gambling comorbidity is that a) people appear to be inheriting a shared genetic vulnerability for several conditions (i.e., problem gambling; substance use/abuse; antisociality; mood disorders); and b) many of the other risk factors for problem gambling are also independent risk factors for these comorbidities. Thus, generic prevention initiatives targeting a wide range of problems (especially in youth) are likely both efficient and essential components for the prevention of problem gambling.

Identification and Treatment of Substance Abuse, Depression, Behavioural Addictions, and Other Comorbidities will help Prevent Problem Gambling

Substance abuse, depression, and behavioural addictions all appear to have some etiological role in the initial onset of problem gambling. Consequently, identifying and effectively treating these conditions should also decrease the incidence of problem gambling. Also, because these conditions, as well as a wider range of mental health problems, also have an even more important role in problem gambling continuation and relapse, it is essential that problem gamblers presenting for treatment have these comorbidities routinely assessed and concurrently treated.

Limit Exposure to Gambling in People with the Greatest Vulnerability

Many of the risk factors for problem gambling have a significant biological basis (personality, mental disorders, substance abuse, intelligence, antisociality), which makes them difficult to address. However, limiting exposure to gambling opportunities in people with these vulnerabilities is one way to do this. Within most jurisdictions, the greatest concentration of people with these attributes occurs in lower socioeconomic neighbourhoods. Thus, not placing gambling opportunities in these types of neighbourhoods is one indirect way of addressing these biological vulnerabilites. Placing gambling venues in tourist destinations away from major urban centres provides a further safeguard for the local populace (as well as resulting in much better economic benefit because of the out-of-jurisdiction source of the revenue).

Gambling-Related Variables Represent the Most Modifiable Risk Factors

Most of the modifiable risk factors are gambling-related (i.e., engagement in continuous forms, gambling intensity, motivations for gambling, social context for gambling, gambling fallacies), which is fortunate, as gambling involvement is also the final common pathway for *all* problem gamblers.

Eliminate, Reduce, or Constrain Continuous Forms of Gambling

The present study confirmed that the most dependency-prone form of gambling are continuous forms with rapid game frequency, with EGMs and casino table games epitomizing this feature. Eliminating or substantially reducing the numbers of these games would have significant preventative value. Alternatively, constraining how they operate. To date, the considerable effort that has been put into modifying EGM parameters to reduce their dependency-forming impact has had very limited effect. However, strategies that impose 'hard limits' on expenditure, reinforcement frequency, privacy, and comfort have the best potential to minimize harm. This involves limiting EGM speed, maximum bet size, maximum win size, frequency of near misses, number of play lines, and seating (Williams, West & Simpson, 2012).

Implement Policies to Constrain Risky Gambling Practices

The present study identified several gambling practices associated with future problem gambling: membership in a gambling rewards program; more frequent use of automatic teller machines (ATMs) in gambling venues; using tobacco while gambling; and gambling alone rather that with friends. Policies could be implemented to constrain or eliminate most of these practices. Although not investigated in the present study, there are several other additional policies that are also known to have value in preventing problem gambling: mandatory player pre-commitment, operator-imposed maximum loss limits, and automated intervention to alert players to risky behavioural patterns (see Williams, West & Simpson (2012) for a review).

Decrease the General Availability of Gambling

Although gambling availability may only have modest impacts on promoting the initial onset of problem gambling, it appears to be an important factor in problem gambling continuation and relapse. There are several ways to reduce gambling availability: reducing the number of gambling venues; reducing the density of gambling opportunities within these venues; reduced venue hours of operation; not providing convenient 24 hour online gambling; reducing the number of gambling formats available; and restricting gambling opportunities to dedicated gambling venues.

Promote Knowledge, Motivations, and Attitudes Conducive to Responsible Gambling

Lack of knowledge about gambling (primarily in the form of gambling fallacies) and inappropriate motivations for gambling (to escape or win money) were important predictors of risk in the present study. Accordingly, educational interventions with demonstrated ability to change and shape relevant knowledge, attitudes, skills, and practices should be widely offered.

The type of *knowledge* that is likely to contribute to prevention includes awareness of one's own gambling profile and the associated risks of excessive involvement. Key knowledge gains need to be achieved in relation to:
- The dependency-forming potential of gambling.
- The signs/symptoms of impaired control/problem gambling.
- The negative consequences that arise from problem gambling.
- The elevated risk of continuous forms of gambling.
- The facilitation of problem gambling that occurs when there is ongoing interaction with other people having intensive and/or problematic levels of involvement.
- Normative levels of time and money allocations on gambling.[40]

---

[40] Normative feedback about alcohol use has been shown to decrease alcohol misuse in university and college students in some circumstances (Moreira, Smith & Foxcroft, 2009).

- The true odds of various gambling games and that most commercial forms of gambling have a negative mathematical expectation over time.
- Low risk limits or guidelines that predict problem-free gambling.[41]
- Gambling practices that increase the risk of impaired control and negative consequences.
- Where to go for help.

This increased knowledge of gambling and problem gambling is particularly important for new gamblers. *An educational session for all new gamblers would be one way of accomplishing this.*

A particularly important sub-category of change to knowledge/beliefs is the correction of gambling fallacies common to both gamblers and problem gamblers. Chief among gambling-related erroneous cognitions are the misunderstanding of the independence of random events (i.e., not appreciating the "reload" feature of each play), ignoring the law of large numbers and averages, belief that outcomes can be controlled or predicted, superstitious conditioning, and selective memory for wins. A related strategy involves ensuring that such erroneous cognitions are not transmitted or reinforced while players gamble. For instance, certain structural features of EGMs (e.g., the showing of near misses, the use of stop buttons, and the visual dominance of winning symbols while reels are spinning) actively "disinform" players by encouraging them to embrace logical but erroneous perceptions from what they are seeing and experiencing. Reducing or eliminating game features and operating practices likely to foster the adoption of erroneous cognitions, constitutes an important best practice for the prevention of problem gambling.

The outcomes described above lay the ground work for developing complementary attitudes to further reduce the likelihood of adopting risky gambling practices. Research suggests that the following key attitudes should be considered as outcomes for educational interventions and initiatives:

---

[41] *Low Risk Guidelines for Gambling* have been proposed (based largely on cross-sectional data) with one of the central guidelines being not spending more than 1% of income on gambling (Currie et al., 2006; 2008; 2012). Although there are many predictors of future problem gambling, intervening to prevent *intensive gambling involvement* may have particularly important utility, as this variable reliably precedes the development of problem gambling in all problem gamblers (unlike the other predictor variables). The present study provides longitudinal support for these *Low Risk* guidelines in that aggregate gambling expenditure was found to be one of the strongest individual predictors. On the other hand, gambling expenditure on its own has relatively modest predictive power. Supplementary analysis of the QLS data determined that when using level of gambling expenditure as the only predictor, 82% of non-problem gamblers in the next assessment are correctly identified, but only 67% of people who became problem gamblers (against a chance accuracy of 50%). This predictive accuracy would no doubt increase if income is also taken into account. However, the point being made is that the predictive accuracy of these *Low Risk Guidelines* could be considerably improved with the addition of one or more variables demonstrated to have additive predictive power in the present study: past history of problem gambling; higher frequency of involvement in EGMs and/or casino table games; having family members and/or close friends that are regular or problem gamblers; having a big gambling win in the past year; higher levels of gambling fallacies; using gambling as a way of escaping from problems; and having a history of impulsivity.

- Gambling should only come from cash dedicated to leisure expenses that the player can afford to lose.
- Borrowed money should never be used to gamble.
- Financial, health and social problems associated with problem gambling can be serious and are worth avoiding.
- Adopting risky practices and cognitions increases the likelihood of becoming a problem gambler.
- Increasing benefits from Reward/Loyalty cards are a sign that gambling losses are escalating.
- Gambling is an inappropriate way to cope with problems.
- Gambling should be engaged in for entertainment only.

Keep Prevention Initiatives in Place for a Sustained Period of Time because Population-Wide Behavioural Change takes a Long Time

Even where comprehensive approaches have been applied in allied fields, immediate effects on behaviour have sometimes been small, or absent. Tobacco use best illustrates this point. There was no dramatic reduction in tobacco use after prevention efforts began in the mid-1960s. Rather, a very slow but progressive decline has been seen over the past 50 years as educational efforts, policies, and public attitudes have coalesced and strengthened. Similar observations apply to the prolonged process of changing drinking practices and lowering the incidence of impaired driving. Prevention approaches appear to be mobilizing more quickly with gambling, so there is some possibility that reductions in problem gambling may occur more quickly. Valuable lessons have been learned in allied prevention fields, and there is reason to believe that cohesive strategies for the prevention of problem gambling will develop accordingly. This optimism suggests that the incidence of problem gambling may reduce over a condensed time frame, given the appropriate coalescence of effective educational resources, health-oriented policy, and political will. Indeed, there is already evidence of a systematic decline in problem gambling prevalence rates in the past 15 years (Williams, Volberg & Stevens, 2012).

REFERENCES

Aarts H, Verplanken B & Knippenberg A (1998). Predicting behavior from actions in the past: Repeated decision making or a matter of habit? *Journal of Applied Social Psychology*, *28*(15), 1355-1374.

Abbott MW (2012). *Pacific Islands Longitudinal Families Study.* Presentation at the 11th Annual Alberta Gambling Research Institute Conference. Banff, Alberta. April 13-14. http://dspace.ucalgary.ca/bitstream/1880/48950/1/Abbott_AGRI_Conference_2012.pdf

Abbott MW & Volberg RA (1991). *Gambling and Problem Gambling in New Zealand: Report on Phase One of the National Survey*. Research Unit, Department of Internal Affairs.

Abbott MW & Volberg RA (1992). *Frequent and Problem Gambling in New Zealand.* Wellington: Department of Internal Affairs.

Abbott MW & Volberg RA (2006). The measurement of adult problem and pathological gambling. *International Gambling Studies, 6*(2), 175-200.

Abbott MW, Volberg RA & Williams MM (1999). *Seven Years On: A Follow-Up Study of Frequent and Problem Gamblers Living in the Community.* Department of Internal Affairs Wellington, New Zealand.

Abbott MW, Williams MM & Volberg RA (2004). A prospective study of problem and regular non-problem gamblers living in the community. *Substance Use & Misuse, 39,* 855-884.

Afifi TO, Cox BJ, Martens PJ, Sareen J & Enns MW (2010a). Demographic and social variables associated with problem gambling among men and women in Canada. *Psychiatry Research*, *178*(2), 395-400.

Afifi TO, Cox BJ, Martens PJ, Sareen J & Enns MW (2010b). The relationship between problem gambling and mental and physical health correlates among a nationally representative sample of Canadian women. *Canadian Journal of Public Health*, *101*, 171-175.

Agrawal A & Lynskey MT (2008). Are there genetic influences on addiction: evidence from family, adoption and twin studies. *Addiction, 103* (7), 1069-81.

Alegria AA, Petry NM, Hasin DS, Liu S-M, Grant BF & Blanco C (2009). Disordered gambling among racial and ethnic groups in the US: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *CNS Spectrums, 14*(3), 132-142.

American Psychiatric Association (2000). *DSM-IV-TR: Diagnostic and Statistical Manual of Mental Disorders, Text Revision*. APA.

Aquilino WS (1997). Privacy effects on self-reported drug use: Interactions with survey mode and respondent characteristics. *NIDA Research Monograph*, *167*, 383-415.

Bagby RM, Vachon DD, Bulmash E, Toneatto T, Quilty LC & Costa PT (2007). Pathological gambling and the five factor model of personality. *Personality and Individual Differences, 43*, 873–880.

Barnes GM, Welte JW, Hoffman JH & Dintcheff BA (1999). Gambling and alcohol use among youth: Influences of demographic, socialization, and individual factors. *Addictive Behaviors, 24*(6), 749-767.

Barnes GM, Welte JW, Hoffman JH & Dintcheff BA (2002). Effects of alcohol misuse on gambling patterns in youth. *Journal of Studies on Alcohol, 63*, 767-775.

Barnes GM, Welte JW, Hoffman JH & Dintcheff BA (2005). Shared predictors of youth gambling, substance use, and delinquency. *Psychology of Addictive Behaviors, 19*, 165-174.

Baron E & Dickerson M (1999). Alcohol consumption and self-control of gambling behaviour. *Journal of Gambling Studies, 15*(1), 3-15.

Beaver KM, Hoffman T, Shields RT, Vaughn MG, DeLisi M & Wright JP (2010). Gender differences in genetic and environmental influences on gambling: Results from a sample of twins from the National Longitudinal Study of Adolescent Health. *Addiction, 105,* 536-542.

Bernstein DP, Ahluvalia T, Pogge D & Handelsman L (1997). Validity of the Childhood Trauma Questionnaire in an adolescent psychiatric population. *Journal of the American Academy of Child & Adolescent Psychiatry, 36,* 340-348.

Billi R, Stone CA, Marden P & Yeung K (2014). *Victorian Gambling Study: A Longitudinal Study of Gambling and Health in Victoria, 2008-2012.* Victoria, Australia: Victorian Responsible Gambling Foundation.

Binde P (2007). Selling dreams – causing nightmares? On gambling advertising and problem gambling. *Journal of Gambling Issues, 20*, 167-192.

Binde P (2009). Exploring the impact of gambling advertising: An interview study of problem gamblers. *International Journal of Mental Health and Addiction, 7* (4), 541-554.

Blanco C, Hasin DS, Petry N, Stinson FS & Grant BF (2006). Sex differences in subclinical and DSM-IV pathological gambling: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychological Medicine*, *36*(07), 943-953.

Blaszczynski A, Dumlao V & Lange M (1997). "How much do you spend gambling?" Ambiguities in survey questionnaire items. *Journal of Gambling Studies, 13*(3), 237-252.

Blaszczynski A & McConaghy N (1994). Antisocial personality disorder and pathological gambling. *Journal of Gambling Studies, 10*, 129-145.

Blaszczynski A & Nower L (2002). A pathways model of problem and pathological gambling. *Addiction, 97,* 487-499.

Blaszczynski A & Nower L (2010). Instrumental tool or drug: Relationship between attitudes to money and problem gambling. *Addiction Research and Theory, 18,* 681-691.

Boivin M (1999). Religiosity measure. In PC Hill & RW Hood Jr. (Eds.), *Measures of Religiosity.* Birmingham, AL: Religious Education Press.

Boots-Miller B, Ribisl K, Mowbray C, Davidson W, Walton M & Herman S (1998). Methods of ensuring high follow-up raters: Lessons from a longitudinal study of dual diagnosed participants. *Substance Use and Misuse*, 33, 2665-2685.

Breyer JL, Botzet AM, Winters KC, Stinchfield RD, August G & Realmuto G (2009). Young adult gambling behaviors and their relationship with the persistence of ADHD. *Journal of Gambling Studies, 25*(2), 227-238.

Brooks G, Ellis T & Lewis C (2008). Pachinko: A Japanese addiction? *International Gambling Studies, 8*(2), 193 - 205.

Buchel C (2006). Neuroimaging findings in pathological gambling. *European Neuropsychopharmacology, 16*(S 4), S181-S182.

Buckner J (1988). Development of an instrument to measure neighborhood cohesion. *American Journal of Community Psychology, 16*(6), 771-791.

Byrnes JP, Miller DC & Schafer WD (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin*, *125*(3), 367.

Carlton PL, Manowitz P, McBride H, Nora R, Swartzburg M & Goldstein L (1987). Attention deficit disorder and pathological gambling. *Journal of Clinical Psychiatry, 48*(12), 487-488.

Chambers R & Potenza M (2003). Neurodevelopment, Impulsivity, and adolescent gambling. *Journal of Gambling Studies, 19*(1), 53-84.

Clark C, Nower L & Walker DM (2013). The relationship of ADHD symptoms to gambling behavior in the USA: Results from the National Longitudinal Study of Adolescent Health. *International Gambling Studies, 13,* 37-51.

Claus RE, Kindleberger LR & Dugan MC (2002). Predictors of attrition in a longitudinal study of substance abusers. *Journal of Psychoactive Drugs*, *34*, 69-74.

Collins RL, Ellickson PL, Hays RD & McCaffrey DF (2000). Effects of incentive size and timing on response rates to a follow-up wave of a longitudinal mailed survey. *Evaluation Review*, *24*, 347-363.

Coman GJ, Burrows GD & Evans BJ (1997). Stress and anxiety as factors in the onset of problem gambling: Implications for treatment. *Stress Medicine*, *13*(4), 235-244.

Costa PT & McCrae RR (1992). *NEO PI-R Professional Manual.* Odessa, FL: Psychological Assessment Resources.

Cotter RB, Burke JD, Loeber R & Navratil JL (2002). Innovative retention methods in longitudinal research: A case study of the Developmental Trends Study. *Journal of Child and Family Studies*, 11, 485-498.

Cottler LB & Cunningham-Williams R (1998). *The 11-Year Incidence of Gambling Problems among Drug Users Recruited from the St. Louis ECA Study*. Presented at the National Academy of Social Services Workshop on the Social and Economic Impact of Gambling. Washington, DC. June 1998.

Council of American Survey Research Organizations (CASRO). (1982). *On the Definition of Response Rates.* Port Jefferson, NY: CASRO.

Crockford DN & el-Guebaly N (1998). Psychiatric comorbidity in pathological gambling: A critical review. *Canadian Journal of Psychiatry, 43*(1), 43-50.

Cummins RA, Eckersley R, Pallant J, Van Vugt J & Misajon R (2003). Developing a national index of subjective wellbeing: The Australian Unity Wellbeing Index. *Social Indicators Research, 64*, 159-190.

Cunningham-Williams RM, Cottler L, Compton W & Spitznagel E (1998). Taking chances: Problem gamblers and mental health disorders – Results from the St. Louis Epidemiologic Catchment Area Study. *American Journal of Public Health, 88*(7), 1093-1096.

Cunningham-Williams RM, Crucza RA, Cottler LB, Womack SB, Books SJ, Przybeck TR, et al. (2005). Prevalence and predictors of pathological gambling: Results from the St. Louis Personality, Health and Lifestyle (SLPHL) Study. *Journal of Psychiatric Research, 39*, 377-390.

Currie SR, Hodgins DC & Casey DM (2013). Validity of the problem gambling severity index interpretive categories. *Journal of Gambling Studies*, *29*(2), 311-327.

Currie SR, Hodgins DC, Casey DM, el-Guebaly N, Smith GJ, Williams RJ, Schopflocher DP & Wood RT (2012). Examining the predictive validity of low-risk gambling limits with longitudinal data. *Addiction*, 107 (2), 400-6.

Currie SR, Hodgins DC, Wang J, el-Guebaly N, Wynne H & Chen S (2006). Risk of harm from gambling in the general population as a function of level of participation in gambling activities. *Addiction, 101*, 570–580.

Currie SR, Hodgins DC, Wang J, el-Guebaly N, Wynne H & Miller NV (2008). Replication of low-risk gambling limits using Canadian provincial gambling prevalence data. *Journal of Gambling Studies, 24* (3), 321-335.

Cyders MA & Smith GT (2008). Clarifying the role of personality dispositions in risk for increased gambling behavior. *Personality and Individual Differences, 45*(6), 503-508.

Dannon PN, Kushnir T, Aizer A, Gross-Isseroff R, Kotler M et al. (2011). Alternational learning in pathological gamblers: an fMRI study. *Brain Imaging and Behavior, 5,* 45-51

DeFuentes-Merillas L, Koeter,MWJ, Schippers GM & Van Den Brink W (2004). Temporal stability of pathological scratchcard gambling among adult scratchcard buyers two years later. *Addiction, 99,* 117-127.

De Graaf R, Bijl R, Smit F, Ravelli A & Vollebergh WA (2000). Psychiatric sociodemographic predictors of attrition in a longitudinal study: The Netherlands Mental Health Survey and Incidence Study. *American Journal of Epidemiology, 1152* (11), 1039-1047.

Delfabbro PH & Winefeld AH (2000). Predictors of irrational thinking in regular slot machine gamblers. *The Journal of Psychology*, *134*(2), 117–128.

Delfabbro PH, Winefield AH & Anderson S (2009). Once a gambler – always a gambler? A longitudinal analysis of gambling patterns in young people making the transition from adolescence to adulthood*. International Gambling Studies, 9*(2), 151-163.

Dellis A, Hofmeyr A, Kincaid H & Ross D (2013). *The National Longitudinal Study of Gambling Behaviour: Preliminary Results*. Presentation at the 15th International Conference on Gambling & Risk Taking. Las Vegas, Nevada. May 30, 2013.

Diener ED, Emmons RA, Larsen RJ & Griffin S (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*, 71-75.

Dowling N, Smith D & Thomas T (2005). Electronic gaming machines: Are they the 'crack-cocaine' of gambling? *Addiction, 100*(1), 33-45.

Durlak JA & Wells AM (1997). Primary prevention mental health programs for children and adolescents: A meta-analytic review. *American Journal of Community Psychology, 25*, 115-152.

Dussault F, Brendgen M, Vitaro F, Wanner B & Tremblay RE (2011). Longitudinal links between impulsivity, gambling problems and depressive systems: A transactional model from adolescence to early adulthood. *The Journal of Child Psychology and Psychiatry, 52*(2), 130-138.

Eaton WW, Anthony JC, Tepper S & Dryman A (1992). Psychopathology and attrition in The Epidemiologic Catchment Area surveys. *American Journal of Epidemiology, 135* (9), 1051-9.

Eisen SA, Lin N, Lyons M, Scherrer JF, Griffith K, True WR et al. (1998). Familial influences on gambling behavior: An analysis of 3359 twin pairs*. Addiction, 93*(9), 1375-1384.

el-Guebaly N, Casey DM, Currie S, Hodgins DC, Schopflocher D, Smith GJ & Williams RJ (2015). *The Leisure, Lifestyle, & Lifecycle Project (LLLP): A Longitudinal Study of Gambling in Alberta.* Final Report for the Alberta Gambling Research Institute. February 2015.

el-Guebaly N, Casey DM, Hodgins DC, Smith GJ, Williams RJ, Schopflocher DP & Wood RT (2008). Designing a longitudinal cohort study of gambling in Alberta: Rationale, methods, and challenges. *Journal of Gambling Studies, 24*, 579-504.

el-Guebaly N & Hodgins D (2000). *Pathological Gambling: The Biopsychological Variables and their Management: A Review of the Literature*. Edmonton, AB: Alberta Gaming Research Institute.

el-Guebaly N, Patten SB, Currie S, Williams JVA, Beck CA, Maxwell CJ, et al. (2006). Epidemiological associations between gambling behavior, substance use & mood and anxiety disorders. *Journal of Gambling Studies, 22*, 275-287.

Ellery M, Stewart SH & Loba P (2005). Alcohol's effects on video lottery terminal (VLT) play among probable pathological and non-pathological gamblers. *Journal of Gambling Studies, 21*(3), 299-324.

Faregh N & Derevensky J (2011). A comparative latent class analysis of endorsement profiles of DSM-IV diagnostic criteria for problem gambling among adolescents in a community and treatment sample. *Addiction Research and Theory, 19* (4), 323-333.

Feigelman W, Gorman BS & Lesieur H (2006). Examining the Relationship Between At Risk Gambling and Suicidality in a National Representative Sample of Young Adults. *Suicide and Life-Threatening Behavior, 36,* 396-408.

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

Fong L, Law R & Lam D (2014). An examination of factors driving Chinese Gamblers' Fallacy bias. *Journal of Gambling Studies, 30* (3), 757-770.

Fortune EE & Goodie AS (2012). Cognitive distortions as a component and treatment focus of pathological gambling. *Psychology of Addictive Behaviors*, 26(2), 298-310.

Gaboury A & Ladouceur R (1989). Erroneous perceptions and gambling. *Journal of Social Behavior and Personality, 4*, 411-420.

Gerstein D, Murphy S, Toce M, Hoffmann J, Palmer A, Johnson R, Larison C, et al. (1999). *Gambling Impact and Behavior Study: Report to the National Gambling Impact Study Commission.* Chicago: National Opinion Research Center.

Gibbs Van Brunschot E (2009). [*Gambling and Risk Behaviour: A Literature Review*](#). Final Report prepared for the Alberta Gaming Research Institute. March 2009.

Goldman D, Oroszi G & Ducci F (2005). The genetics of addictions: Uncovering the genes. *Nature Reviews: Genetics, 6,* 521-532.

Goodman A (2008). Neurobiology of addiction: An integrative review. *Biochemical Pharmacology, 75*, 266-322.

Goudriaan A, Oosterlaan J, de Beursc E & van den Brinka W (2004). Pathological gambling: a comprehensive review of biobehavioral findings. *Neuroscience and Biobehavioral Reviews, 28*, 123–141.

Goudriaan AE, Slutske WS, Krull JL & Sher KJ (2009). Longitudinal patterns of gambling activities and associated risk factors in college students. *Addiction, 104*(7), 1219-1232.

Grant JE, Brewer J & Potenza M (2006). The neurobiology of substance and behavioral addictions. *CNS Spectrums, 11*(12), 924-930.

Grant JE & Kim SW (2002). Parental bonding in pathological gambling disorder. *Psychiatric Quarterly, 73*, 239-247.

Grant JE, Kushner MG & Kim SW (2002). Pathological gambling and alcohol use disorder. *Alcohol Research and Health*, *26*(2), 143-150.

Griffiths MD (2005a). A components model of addiction within a biopsychosocial framework. *Journal of Substance Use, 10* (4), 191-197.

Griffiths MD & Delfabbro P (2001). The biopsychosocial approach to gambling: Contextual factors in research and clinical interventions*. eGambling: The Electronic Journal of Gambling Issues, Issue 5.* [now known as the *Journal of Gambling Issues*].

Gupta R & Derevensky JL (1998). Adolescent gambling behavior: A prevalence study and examination of the correlates associated with problem gambling. *Journal of Gambling Studies, 14*(4), 319-345.

Hardoon KK, Gupta R & Derevensky JL (2004). Psychosocial variables associated with adolescent gambling. *Psychology of Addictive Behaviors*, *18*(2), 170.

Hodgins DC & el-Guebaly N (2004). Retrospective and prospective reports of precipitants to relapse in pathological gambling. *Journal of Consulting and Clinical Psychology, 72* (1), 72-80.

Hodgins DC & Makarchuk K (2003). Trusting problem gamblers: Reliability and validity of self-reported gambling behavior. *Psychology of Addictive Behaviors, 17*, 244-248.

Hodgins DC, Schopflocher DP, el-Guebaly N, Casey DM, Smith GJ, Williams RJ & Wood RT (2010). The association between childhood maltreatment and gambling problems in a community sample of adult men and women. *Psychology of Addictive Behaviors*, *24*(3), 548.

Hofmeyr A, Dellis A, Kincaid H & Ross D (2011). *[Report on the National Longitudinal Study of Gambling Behaviour (NLSGB) in South Africa.](#)* September 2011 preliminary report for the South African Responsible Gambling Foundation.

Holder HD (2005). Community prevention of young adult drinking and associated problems. *Alcohol Research & Health, 28*(4), 245-249.

International Wellbeing Group (2013). *Personal Wellbeing Index: 5th Edition.* Melbourne: Australian Centre on Quality of Life, Deakin University.

Jackson C, Geddes R, Haw S & Frank J (2012). Interventions to prevent substance use and risky sexual behaviour in young people: a systematic review. *Addiction, 107* (4), 733-747.

Jacobson NS & Truax P (1991). Clinical significance: a statistical approach to defining meaningful change in psychotherapy-research. *Journal of Consulting and Clinical Psychology, 59*, 12-19.

Jacques C & Ladouceur R (2006). A prospective study of the impact of opening a casino on gambling behaviours: 2-and 4-year follow-ups. *The Canadian Journal of Psychiatry*, *51,* 764-773.

Jacques C, Ladouceur R & Ferland F (2000). Impact of availability on gambling: A longitudinal study. *The Canadian Journal of Psychiatry, 45,* 810-815.

Johansson A, Grant JE, Kim SW, Odlaug BL & Gotestam KG (2009a). Risk factors for problematic gambling: A critical literature review. *Journal of Gambling Studies, 25*, 67-92.

Johansson A, Grant JE, Kim SW, Odlaug BL & Gotestam KG (2009b). Risk factors for problematic gambling: A critical literature review. *Journal of Gambling Studies, 25*, 67-92.

Joukhador J, Blaszczynski A & Maccallum F (2004). Superstitious beliefs in gambling among problem and non-problem gamblers: Preliminary data. *Journal of Gambling Studies, 20*(2), 171-180.

Joukhador J, Maccallum F & Blaszczynski A (2003). Differences in cognitive distortions between problem and social gamblers. *Psychological Reports, 92*(3, Pt. 2), 1203-1214.

Ka-Chio Fong D & Orozio B (2005). Gambling participation and prevalence estimates for pathological gambling in a Far East gambling city: Macao. *UNLV Gaming Research & Review Journal, 9*, 15-28.

Kairouz S, Nadeau L & Luce C (2012). *The Pathway of Gamblers in Quebec from 2009 to 2011: have they changed and why?* Presentation at the 11th Annual Alberta Gambling Research Institute Conference. Banff, Alberta. April 13-14.

Kalischuk RG, Nowatzki N, Cardwell K, Klein K & Solowoniuk J (2006). Problem gambling and its impact on families: A literature review. *International Gambling Studies, 6*(1), 31-60.

Kassinove JI & Schare ML (2001). Effects of the" near miss" and the" big win" on persistence at slot machine gambling. *Psychology of Addictive Behaviors*, *15*(2), 155.

Kausch O, Rugle L & Rowland DY (2006). Lifetime histories of trauma among pathological gamblers. *The American Journal on Addictions, 15*, 35-43.

Kessler RC, Adler L, Ames M, Demler O, Faraone S, Hiripi E, Howes MJ, Jin R, Secnik K, Spencer T, Ustun TB & Walters EE (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35*, 245-256.

Kessler RC, Andrews G, Mroczek D, Ustun B & Wittchen H-U (1998). The World Health Organization Composite International Diagnostic Interview short form (CIDI-SF). *International Journal of Methods in Psychiatric Research, 7* (4), 171-185.

Kim SW, Grant JE, Eckert ED, Faris PL & Hartman BK (2006). Pathological gambling and mood disorders: Clinical associations and treatment implications. *Journal of Affective Disorders, 92*, 109-116.

Koenen KC, Moffitt TE, Robert AL, Martin LT, Kubzansky L, Harrington H, Poulton R & Caspi A (2009). Childhood IQ and adult mental disorders: A test of the cognitive reserve hypothesis. *American Journal of Psychiatry, 166,* 50-57.

Kong G, Tsai J, Krishnan-Sarin S, Cavallo DA, Steinberg MA, Rugle L & Potenza MN (2014). A latent class analysis of pathological-gambling criteria among high school students: Associations with gambling, risk and health/functioning characteristics. *Journal of Addiction Medicine, 8* (6), 421-430.

Kotov R, Gamez W, Schmidt F & Watson D (2010). Linking "big" traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin, 136,* 768–821.

Kubicka L, Matejcek Z, Dytrych Z & Roth Z (2001). IQ and personality traits assessed in childhood as predictors of drinking and smoking behaviour in middle-aged adults: a 24-year follow-up study. *Addiction, 96*, 1615–1628.

Kumpfer KL, Trunnell EP & Whiteside HO (1990). The biopsychosocial model: Application to the addictions field. In RC Engs (ed.), *Controversies in the Addiction Field*. pp. 55-67. Kendal-Hunt: Dubuque, Iowa.

Kyngdon A & Dickerson M (1999). An experimental study of the effect of prior alcohol consumption on a simulated gambling activity. *Addiction, 94*(5), 697-707.

LaBrie RA, Kaplan S, LaPlante DA, Nelson SE & Shaffer HJ (2008). Inside the virtual casino: A prospective longitudinal study of actual Internet casino gambling. *European Journal of Public Health*, 18(4), 410-416.

LaBrie RA, LaPlante DA, Nelson SE, Schumann A & Shaffer HJ (2007). Assessing the playing field: A prospective longitudinal study of Internet sports gambling behavior. *Journal of Gambling Studies. 23*(3), 347-362.

LaBrie RA & Shaffer HJ (2011). Identifying behavioral markers of disordered Internet sports gambling. *Addiction Research & Theory, 19,* 56-65.

Ladouceur R & Sévigny S (2005). Structural characteristics of Video Lotteries: Effects of a stopping device on Illusion of Control and gambling persistence. *Journal of Gambling Studies*, *21*(2), 117–131.

Ladouceur R, Sylvain C, Boutin C, Lachance S, Doucet C, Leblond J et al. (2001). Cognitive treatment of problem gambling. *The Journal of Nervous and Mental Disease, 189*, 774-780.

Ladouceur R & Walker R (1996). A cognitive perspective on gambling. In PM Salkovskis (Ed.), *Trends in Cognitive and Behavioral Therapies* (pp. 89-120). New York: Wiley.

Langhinrichsen-Rohling J, Rohde P, Seeley JR & Rohling ML (2004). Individual, family, and peer correlates of adolescent gambling. *Journal of Gambling Studies, 20*, 23-46.

LaPlante DA, Kleschinsky JH, LaBrie RA, Nelson SE & Shaffer HJ (2009). Sitting at the virtual poker table: A prospective epidemiological study of actual Internet poker gambling behavior. *Computers in Human Behavior*, 25(3), 711-717.

LaPlante DA, Nelson SE, LaBrie RA & Shaffer HJ (2012). The Bwin Division on Addictions Research collaborative: Challenges for the normal science of Internet gambling. In RJ Williams, RT Wood & J Parke (Eds.), *Routledge International Handbook of Internet Gambling.* UK: Routledge.

LaPlante DA, Schumann A, LaBrie RA & Shaffer HJ (2008). Population trends in Internet Sports Gambling. *Computers in Human Behavior, 24*, 2399-2414.

LaPlante DA & Shaffer HJ (2007). Understanding the influence of gambling opportunities: Expanding exposure models to include adaptation. *American Journal of Orthopsychiatry, 77*(4), 616-623.

Lau ALD & Cummins RA (2005). *Test-Retest Reliability of the Personal Wellbeing Index Adult.* The Deakin University, Australia.

Lau ALD, Cummins RA & McPherson W (2005). An Investigation into the Cross-Cultural Equivalence of the Personal Wellbeing Index. *Social Indicators Research, 72*, 403-432.

Lawrence AJ, Luty J, Bogdan NA, Sahakian BJ & Clark L (2009). Problem gamblers share deficits in impulsive decision-making with alcohol-dependent individuals. *Addiction, 104*(6), 1006-1015.

Ledgerwood DM & Petry NM (2006). Psychological experience of gambling and subtypes of pathological gamblers. *Psychiatry Research*, *144*(1), 17-27.

Ledgerwood DM & Petry NM (2010). Subtyping pathological gamblers based on impulsivity, depression, and anxiety. *Psychology of Addictive Behaviors, 24* (4), 680-688.

Ledgerwood DM, Wiedemann AA, Moore J & Arfken CL (2012). Clinical characteristics and treatment readiness of male and female problem gamblers calling a state gambling helpline. *Addiction Research & Theory*, *20*(2), 162-171.

Lee GP, Storr CL, Ialongo NS & Martins SS (2011). Compounded effect of early adolescence depressive symptoms and impulsivity on late adolescence gambling: A longitudinal study. *Journal of Adolescent Health, 48*(2), 164-169.

Lesieur HR & Blume SB (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of pathological gamblers. *American Journal of Psychiatry*, *144*(9).

Lesieur HR, Cross J, Frank M, Welch M, White CM, Rubenstein G & Mark M (1991). Gambling and pathological gambling among university students. *Addictive Behaviors, 16*(6), 517-527.

Lesieur HR & Custer RL (1984). Pathological gambling: Roots, phases, and treatment. *The Annals of the American Academy of Political and Social Science*, 146-156.

Lester D (1994). Access to gambling opportunities and compulsive gambling. *International Journal of the Addictions, 29*(12), 1611-1616.

Li J (2007). Women's Ways of Gambling and Gender-Specific Research. *Sociological Inquiry*, *77*(4), 626-636.

Lobo DS & Kennedy J (2006). The genetics of gambling and behavioral addictions. *CNS Spectrums, 11*(12), 931-939.

Lobo DS & Kennedy JL (2009). Genetic aspects of pathological gambling: a complex disorder with shared genetic vulnerabilities. *Addiction 104*, 1454–1465.

Loo JM, Raylu N & Oei TP (2008). Gambling among the Chinese: A comprehensive review. *Clinical Psychology Review, 28*(7), 1152-1166.

Lorains FK, Cowlishaw S & Thomas SA (2011). Prevalence of comorbid disorders in problem and pathological gambling: Systematic review and meta-analysis of population surveys. *Addiction*, *106*(3), 490-498.

Lubben JE (1988). Assessing social networks among elderly populations. *Family and Community Health, 11*, 42-52.

MacLaren VV, Best LA, Dixon MJ & Harrigan KA (2011). Problem gambling and the five factor model in university students. *Personality and Individual Differences*, *50*(3), 335-338.

MacLaren VV, Fugelsang JA, Harrigan KA & Dixon MJ(2011). The personality of pathological gamblers: A meta-analysis. *Clinical Psychology Review*, *31*(6), 1057-1067.

Marlatt GA, Baer JS, Donovan DM & Kivlahan DR (1988). Addictive behaviours: Etiology and treatment. *Annual Review of Psychology, 39*, 223-252.

Martin F, Lichtenberg PA & Templin TN (2011). A longitudinal study: Casino gambling attitudes, motivations, and gambling patterns among urban elders. *Journal of Gambling Studies, 27*, 287-297.

McComb JL (2010). *A Longitudinal Study of Family Influences on Gambling Behavior in Early Adulthood.* Purdue University). *ProQuest Dissertations and Theses.* http://docs.lib.purdue.edu/dissertations/AAI3444721/

McCormick RA, Russo AM, Ramirez LF & Taber JI (1984). Affective disorders among pathological gamblers seeking treatment. *American Journal of Psychiatry, 141*, 215-218.

McCready J & Adlaf E (2006). *Performance and Enhancement of the Canadian Problem Gambling Index (CPGI): Report and Recommendations*. Guelph: Ontario Problem Gambling Research Centre.

McLaughlin P, White N, King K, Hann RG, Williams RJ, Schopflocher D, West B & Flexhaug T (2014). *Quinte Retention Manual: Methods for Achieving a 94% Retention Rate in Longitudinal Research.* Report prepared for the Ontario Problem Gambling Research Centre. Guelph, Ontario. http://hdl.handle.net/10133/3379

Meng YJ, Deng W, Wang HY, Guo WJ, Li T, Lam C & Lin X (2014). Reward pathway dysfunction in gambling disorder: A meta-analysis of functional magnetic resonance imaging studies. *Behavioural Brain Research*, *275*, 243-251.

Meyer G & Fabian T (1992). Delinquency among pathological gamblers: A causal approach. *Journal of Gambling Studies, 8*, 61-77.

Meyer G, Hayer T & Griffiths M (2009). *Problem Gambling in Europe.* Springer.

Miller NV & Currie SR (2008). A Canadian population level analysis of the roles of irrational gambling cognitions and risky gambling practices as correlates of gambling intensity and pathological gambling. *Journal of Gambling Studies, 24,* 257-274.

Miller NV, Currie SR, Hodgins DC & Casey D (2013). Validation of the problem gambling severity index using confirmatory factor analysis and Rasch modelling. *International Journal of Methods in Psychiatric Research*, *22*(3), 245-255.

Miller WR, Wilbourne PL & Hettema JE (2003). What works? A summary of alcohol treatment outcome research. In RK Hester & WR Miller (Eds.), *Handbook of Alcoholism Treatment Approaches: Effective Alternatives* (3rd ed., pp. 13-63). Boston, MA: Allyn & Bacon.

Modig K, Silventoinen K, Tynelius P, Kaprio J & Rasmussen F (2011). Genetics of the association between intelligence and nicotine dependence: a study of male Swedish twins. *Addiction*, *106*(5), 995-1002.

Mood Disorders Society of Canada. (2004). *Mood Disorders and Problem Gambling: Cause, Effect, or Cause for Concern: A Review of the Literature*. Guelph, Ontario: Author.

Moos RH & Moos BS (2009). *A Social ClimateSscale: Family Environment Scale Manual: Development, Applications, Research* (4th ed.). Palo Alto, CA: Mind Garden, Inc.

Morasco BJ & Petry NM (2006). Gambling problems and health functioning in individuals receiving disability. *Disability & Rehabilitation*, *28*(10), 619-623.

Moreira MT, Smith LA & Foxcroft D (2009). Social norms interventions to reduce alcohol misuse in University or College students. *Cochrane Database of Systematic Reviews 2009, Issue 3.*

Morey L (2007). *The Personality Assessment Inventory: Professional Manual* (2 ed.). Lutz: Psychological Assessment Resources Incorporated.

Morey LC & Hopwood CJ (2006). The Personality Assessment Inventory and the measurement of normal and abnormal personality constructs. In Strack S (Ed.). *Differentiating Normal and Abnormal Personality.* New York: Springer Publishing.

Morrison TC, Wahlgren DR, Hovell MF, Zakarian JU, Burhman-Kreitner S, Hofstetter CR, Slymen DJ. et al. (1997). Tracking and follow-up of 16,915 adolescents: Minimizing attrition bias. *Controlled Clinical Trials, 18*, 383-96.

Myrseth H, Pallesen P, Molde H, Johnsen BH & Lorvik IM (2009). Personality factors as predictors of pathological gambling. *Personality and Individual Differences, 47,* 933–937.

Nation M, Crusto C, Wandersman A, Kumpfer KL, Seybolt D, Morrissey-Kane E et al. (2003). What works in prevention: Principles of effective prevention programs. *American Psychologist, 58*(6-7), 449-456.

National Gambling Impact Study Commission. (1999). *Final Report*. Washington, DC: Author.

National Research Council (1999). *Pathological Gambling: A Critical Review.* Washington, D.C.: National Academy Press.

Neal P, Delfabbro P & O'Neil M (2005). *Problem Gambling and Harm: Towards a National Definition.* Commissioned for the Ministerial Council on Gambling. Prepared by the SA Centre for Economic Studies with the Department of Psychology, University of Adelaide. November 2005.

Nelson SE, LaPlante DA, Peller AJ, Schumann A, LaBrie RA & Shaffer HJ (2008). Real limits in the virtual world: Self-limiting behavior of Internet gamblers. *Journal of Gambling Studies, 24*, 463-477.

Nicholas LJ & Durrheim K (1996). Validity of the Rohrbaugh and Jessor religiosity scale. *Perceptual and Motor Skills, 83*(1), 89-90

Nixon G & Solowoniuk J (2009). Introducing the hero complex and the mythic iconic pathway of problem gambling. *International Journal of Mental Health and Addiction, 7(1),* 108-123.

Nixon G, Solowoniuk J & McGowan V (2006). The counterfeit hero's journey of the pathological gambler: A phenomenological hermeneutics investigation. *Journal of Mental Health and Addiction, 4*(3), 217-232.

Nower L & Blaszczynski A (2006). Impulsivity and pathological gambling: A descriptive model. *International Gambling Studies, 6*(1), 61-75.

Nower L, Martins SS, Lin K-H & Blanco C (2013). Subtypes of disordered gamblers: Results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *Addiction, 108*, 789-798.

Oberg S, Christie G & Tata M (2011). Problem gamblers exhibit reward hypersensitivity in medial frontal cortex during gambling. *Neuropsychologia, 49* (13), 3768-3775.

Ohtsuka K & Chan CC (2010). Donning red underwear to play mahjong: Superstitious beliefs and problem gambling among Chinese mahjong players in Macau. *Gambling Research: Journal of the National Association for Gambling Studies*, *22*(1), 18.

Ouellette JA & Wood W (1998). Habit and intention in everyday life: the multiple processes by which past behavior predicts future behavior. *Psychological Bulletin*, *124*(1), 54.

Pagani LS, Derevensky JL & Japel C (2009). Predicting gambling behavior in sixth grade from kindergarten impulsivity: a tale of developmental continuity. *Archives of Pediatrics & Adolescent Medicine, 163,* 238.

Pagani LS, Derevensky JL & Japel C (2010). Does early emotional distress predict later child involvement in gambling? *The Canadian Journal of Psychiatry, 55*(8), 507-513.

Parhami I, Mohtabai R, Rosenthal RJ, Afifi TO & Fong TW (2014). Gambling and the onset of comorbid mental disorders: a longitudinal study evaluating severity and specific symptoms. *Journal of Psychiatric Practice, 20* (30, 207-19.

Parke A, Griffiths M & Irwing P (2004). Personality traits in pathological gambling: Sensation seeking, deferment of gratification and competitiveness as risk factors. *Addiction Research & Theory, 12*, 201-212.

Petry NM (2005). *Pathological Gambling: Etiology, Comorbidity, and Treatment*. Washington, DC: American Psychological Association.

Petry NM (2007). Gambling and substance use disorders: Current status and future directions. *American Journal on Addictions, 16*(1), 1-9.

Petry NM & Madden GJ (2009). Pathological gamblers discount probabilistic rewards less steeply than controls. *Experimental and Clinical psychopharmacology, 17* (5), 283-290.

Petry NM & Steinberg KL (2005). Childhood maltreatment in male and female treatment-seeking pathological gamblers. *Psychology of Addictive Behaviors, 19*(2), 226-229.

Petry NM, Stinson FS & Grant BF (2005). Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry, 66*(5), 564-574.

Powell J, Hardoon K, Derevensky J & Gupta R (1999). Gambling and risk-taking behavior among university students. *Substance Use & Misuse, 34*(8), 1167-1184.

Prinz RJ, Smith EP, Dumas JE, Laughlin JE, White DW & Barron R (2001). Recruitment and retention of participants in prevention trials involving family-based interventions. *American Journal of Preventive Medicine, 20*(Suppl1), 31-37.

Productivity Commission. (1999). *Australia's Gambling Industries* (Report No. 10). Canberra: AusInfo.

Productivity Commission. (2010). *Gambling Inquiry Report.* Canberra: Commonwealth of Australia.

PsychCorp (1999). *Wechsler Abbreviated Scale of Intelligence Manual*. San Antonio, TX: Harcourt Assessment Inc.

Quigley L, Yakovenko I, Hodgins DC, Dobson KS, el-Guebaly N, Casey DM, Currie SR, Smith GJ, Williams RJ & Schopflocher DP (2014). Comorbid problem gambling and major depression in a community sample. *Journal of Gambling Studies,* 1-18. Epub ahead of print.

Raylu N & Oei TP (2002). Pathological gambling: A comprehensive review. *Clinical Psychology Review, 22,* 1009-1061.

Raylu N & Oei TP (2004). Role of culture in gambling and problem gambling. *Clinical Psychology Review, 23*, 1087-1114.

Regier DA, Boyd JH, Burke JD, Rae DS, Myers JK, Kramer M & Locke BZ (1988). One-month prevalence of mental disorders in the United States: based on five Epidemiologic Catchment Area sites. *Archives of General Psychiatry*, *45*(11), 977-986.

Reith G & Dobbie F (2011). Beginning gambling: The role of social networks and environment. *Addiction Research & Theory, 19*(6), 483-493.

Reith G & Dobbie F (2013). Gambling careers: A longitudinal, qualitative study of gambling behaviour. *Addiction Research & Theory, 21*(5), 376-390.

Reuter J, Raedler T, Rose M, Hand I, Gläscher J & Büchel C (2005). Pathological gambling is linked to reduced activation of the mesolimbic reward system. *Nature Neuroscience, 8*(2), 147-148.

Rohrbaugh J & Jessor R (1975). Religiosity in youth: A personal control against deviant behaviour. *Journal of Personality, 43*, 136-155.

Romild U (2012). *The Swedish Longitudinal Gambling Study (SWELOGS).* Presentation at the 11th Annual Alberta Gambling Research Institute Conference. Banff, Alberta. April 13-14.

Romild U, Volberg RA & Abbott M (2014). The Swedish Longitudinal Gambling Study (Swelogs): design and methods of the epidemiological (EP-) track. *International Journal of Methods in Psychiatric Research, 23*, 372–386, doi: 10.1002/mpr.1449

Ross D & Hofmeyr A (2012). *The National Longitudinal Study of Gambling Behaviour (NLSGB): Preliminary Results.* Presentation at the 11th Annual Alberta Gambling Research Institute Conference. Banff, Alberta. April 13-14.

Rudy EB, Estok PJ, Kerr ME & Menzel L (1994). Research incentives: Money versus gifts. *Nursing Research, 43*(4), 253-255.

Rush BR, Bassani DG, Urbanoski KA & Castel S (2008). Influence of co-occurring mental and substance use disorders on the prevalence of problem gambling in Canada. *Addiction, 103*(11), 1847-1856.

Salyer J, Geddes N, Smith CS & Mark BA (1998). Commitment and communication: Keys to minimizing attrition in multisite longitudinal organizational studies. *Nursing Research*, 47, 123-125.

SAMHSA (2010). *Risk and Protective Factors for Mental, Emotional, and Behavioral Disorders Across the Life Cycle.* Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration.

Sattler JM (1988). *Assessment of Children* (3rd Ed.). San Diego, CA: Author

Schaeffer NC (2000). Asking questions about threatening topics: A selective overview. In AA Stone & JS Turkkan (Eds.), *The Science of Self-Report: Implications for Research and Practice* (pp. 105-121). Mahwah, NJ: Erlbaum.

Scherrer JF, Slutske WS, Xian H, Waterman B, Shah KR, Volberg RA et al. (2007). Factors associated with pathological gambling at 10 year follow-up in a national sample of middle-aged men. *Addiction, 102*, 970-978.

Scholes-Balog KE, Hemphill SA, Dowling NA & Toumbourou JW (2014). A prospective study of adolescent risk and protective factors for problem gambling among young adults. *Journal of Adolescence, 37* (2), 215-24.

Schull ND (2002). *Escape Mechanism: Women, Caretaking, and Compulsive Machine Gambling*. Berkeley: Center for Working Families, University of California, Berkeley.

Schumm WR, Anderson SA, Benigas JE, McCutchen MB, Griffin CL, Morris JE & Race GS (1985). Criterion-related validity of the Kansas Marital Satisfaction Scale. *Psychological Reports, 56*, 719-722.

Schumm WR, Paff-Bergen LA, Hatch R, Obiorah F, Copeland J, Meens J & Bugaighis M (1986). Concurrent and discriminative validity of the Kansas Marital Satisfaction Scale. *Journal of Marriage and Family, 48*(2), 381-387.

Shaffer HJ & Hall MN (2002). The natural history of gambling and drinking problems among casino employees. *The Journal of Social Psychology*, 142(4), 405-424.

Shaffer HJ, LaBrie RA & LaPlante D (2004). Laying the foundation for quantifying regional exposure to social phenomena: Considering the case of legalized gambling as a public health toxin. *Psychology of Addictive Behaviors, 18*(1), 40-48.

Shah KR, Eisen SA, Xian H & Potenza MN (2005). Genetic studies of pathological gambling: a review of methodology and analyses of data from the Vietnam Era Twin Registry. *Journal of Gambling Studies, 21* (2), 179-203.

Sharpe L (2002). A reformulated cognitive-behavioral model of problem gambling: A biopsychosocial perspective. *Clinical Psychology Review, 22*, 1-25.

Shaw MC, Forbush KT, Schlinder J, Rosenman E & Black DW (2007). The effect of pathological gambling on families, marriages, and children. *CNS Spectrums, 12*(8), 615-622.

Shead NW, Callan MJ & Hodgins DC (2008). Probability discounting among gamblers: Differences across problem gambling severity and affect-regulation expectancies. *Personality and Individual Differences, 45*, 536–541.

Shenasse ED, Paradis AD, Dolan SL, Wilhelm CS & Buka SL (2012). Childhood impulsive behavior and problem gambling by adulthood: A 30-year prospective community-based study. *Addiction, 107*(1), 160-168.

Shih RA, Belmonte PL & Zandi PP (2004). A review of the evidence from family, twin and adoption studies for a genetic contribution to adult psychiatric disorders. *International Review of Psychiatry, 16*(4), 260-283.

Skitch S & Hodgins DC (2004). Impulsivity, compulsivity and pathological gambling: An exploratory study of pathological gambling as an impulsivity-compulsivity spectrum disorder. *International Gambling Studies, 4*, 175-188.

Skinner BF (1953). *Science and Human Behavior*. New York: The Free Press.

Slutske WS (2007). Longitudinal studies of gambling behavior. In G Smith, DC Hodgins & RJ Williams (Eds.), *Research and Measurement Issues in Gambling Studies* (pp. 128-154). Burlington, MA: Elsevier.

Slutske WS, Caspi A, Moffitt TE & Poulton R (2005). Personality and problem gambling: A prospective study of a birth cohort of young adults. *Archives of General Psychiatry, 62*, 769-775.

Slutske WS, Eisen SA, True WR, Lyons MJ, Goldberg J & Tsuang M (2000). Common genetic vulnerability for pathological gambling and alcohol dependence in men. *Archives of General Psychiatry, 57*, 666-673.

Slutske WS, Eisen S, Xian H, True WR, Lyons MJ, Goldberg J et al. (2001). A twin study of the association between pathological gambling and antisocial personality disorder. *Journal of Abnormal Psychology, 110*, 297-308.

Slutske WS, Jackson KM & Sher KJ (2003). The natural history of problem gambling from age 18 to 29. *Journal of Abnormal Psychology, 112,* 263-274.

Slutske WS, Meier MH, Zhu G, Statham DJ, Blaszczynski A & Martin NG (2009). The Australian Twin Study of Gambling (OZ-GAM): rationale, sample description, predictors of participation, and a first look at sources of individual differences in gambling involvement. *Twin Research and Human Genetics, 12*, 63-78.

Slutske WS, Moffitt TE, Poulton R & Caspi A (2012). Undercontrolled temperament at age 3 predicts disordered gambling at age 32: A longitudinal study of a complete birth cohort. *Psychological Science, 23* (5), 510-516.

Slutske W, Zhu G, Meier M & Martin N (2010). Genetic and environmental influences on disordered gambling in men and women. *Archives of General Psychiatry, 67*, 624-630.

Specker SM, Carlson GA, Edmonson KM, Johnson PE & Marcotte M (1996). Psychopathology in pathological gamblers seeking treatment. *Journal of Gambling Studies*, *12*(1), 67-81.

St-Pierre RA, Walker DM, Derevensky J & Gupta R (2014). How availability and accessibility of gambling venues influence problem gambling: A review of the literature. *Gaming Law Review and Economics*, *18*(2), 150–172.

Statistics Canada (2006). A sure bet industry. *Perspectives on Labour and Income, 7* (12).

Statistics Canada (2010). Gambling 2010. *Perspectives on Labour and Income*, *11* (8).

Statistics Canada (2013). *Canadian Community Health Survey – Mental Health.*

Steel Z & Blaszczynski A (1998). Impulsivity, personality disorders and pathological gambling severity. *Addiction, 93*(6), 895-905.

Stephenson E (2012). *A Spotlight on 18-24 Year old Gamblers: The Manitoba Longitudinal Study of Young Adults.* Presentation at the 11th Annual Alberta Gambling Research Institute Conference. Banff, Alberta. April 13-14.

Stinchfield R, Govoni R & Frisch GR (2007). A review of screening and assessment instruments for problem and pathological gambling. In G Smith, DC Hodgins & RJ Williams (Eds.), *Research and Measurement Issues in Gambling Studies* (pp. 179–213). London: Elsevier.

Stockwell TR, Gruenewald PJ, Toumbourou JW & Loxley W (2005). *Preventing Harmful Substance Use: The Evidence Base for Policy and Practice*. New York: Wiley.

Strong DR, Breen RB, Lesieur HR & Lejuez CW (2003). Using the Rasch model to evaluate the South Oaks Gambling Screen for use with nonpathological gamblers. *Addictive Behaviors, 28*, 1465-1472.

Strong DR & Kahler CW (2007). Evaluation of the continuum of gambling problems using the DSM-IV. *Addiction, 102*, 713-721.

Strong DR, Lesieur HR, Breen RB, Stinchfield R & Lejuez CW (2004). Using the Rasch model to examine the utility of the South Oaks Gambling Screen across clinical and community samples. *Addictive Behaviors, 29*, 465-481.

Sundqvist K & Wennberg P (2014). Risk gambling and personality: Results from a representative Swedish sample. *Journal of Gambling Studies.* June 1 (epub ahead of print).

Suomi A, Dowling NA & Jackson AC (2014). Problem gambling subtypes based on psychological distress, alcohol abuse and impulsivity. *Addictive Behaviors, 39* (12), 1741-1745.

Svetieva E & Walker M (2008). Inconsistency between concept and measurement: The Canadian Problem Gambling Index (CPGI). *Journal of Gambling Issues, 22*, 157-173.

Tang C, Wu A & Tang J (2007). Gender differences in characteristics of Chinese treatment-seeking problem gamblers. *Journal of Gambling Studies, 23*(2), 145-156.

Teo P, Mythily S, Anantha S & Winslow M (2007). Demographic and clinical features of 150 pathological gamblers referred to a community addictions programme. *Annals of the Academy of Medicine Singapore, 36*(3), 165-168.

Thorndike RL, Hagen EP & Sattler JM (1986). *The Stanford-Binet Intelligence Scale: Guide for Administering and Scoring.* Chicago: Riverside Publishing Company.

Tiliouine H, Cummins RA & Davern M (2006). Measuring wellbeing in developing countries: The case of Algeria. *Social Indicators Research, 75*, 1-30.

Toce-Gerstein M, Gerstein DR & Volberg RA (2003). A hierarchy of gambling disorders in the general population. *Addiction, 98*, 1661-1672.

Toneatto T, Blitz-Miller T, Calderwood K, Dragonetti R & Tsanos A (1997). Cognitive distortions in heavy gambling. *Journal of Gambling Studies, 13*(3), 253-266.

Toneatto T & Nguyen L (2007). Individual characteristics and problem gambling behavior. In G Smith, DC Hodgins & RJ Williams (Eds.), *Research and Measurement issues in Gambling Studies* (pp. 279-303). Burlington, MA: Elsevier.

Tourangeau R & Smith TW (1996). Asking sensitive questions: The impact of data collection mode, question format, and question context. *Public Opinion Quarterly, 60*, 275-304.

Tourangeau R & Yan T (2007). Sensitive questions in surveys. *Psychological Bulletin, 133* (5), 859-883.

Tucker C, Vuchinich RE & Gladsjo JA (1994). Environmental events surrounding natural recovery from alcohol-related problems. *Journal of Addictions Nursing, 6*, 117-128.

Turner NE, Jain U, Spence W & Zangeneh M (2008). Pathways to pathological gambling: Component analysis of variables related to pathological gambling. *International Gambling Studies, 8*(3), 281-298.

Turner NE, Zangeneh M & Littman-Sharp N (2006). The experience of gambling and its role in problem gambling. *International Gambling Studies, 6*(2), 237-266.

Vander Bilt J, Dodge HH, Pandav R, Shaffer HJ & Ganguli M (2004). Gambling participation and social support among older adults: A longitudinal community study. *Journal of Gambling Studies, 20,* 373–390.

van den Bos R, Davies W, Dellu-Hagedorn F, Goudriaan AE, Granon S, Homberg J, Rivalan M, Swendsen J & Adriani W (2013). Cross-species approaches to pathological gambling: a review targeting sex differences, adolescent vulnerability and ecological validity of research tools. *Neuroscience & Biobehavioral Reviews*, *37*(10), 2454-2471.

van der Heijden P, Van Gils G, Bouts J & Hox J (2000). A comparison of randomized response, computer assisted interview, and face-to-face direct questioning: Eliciting sensitive information in the context of welfare and unemployment benefit. *Sociological Methods & Research, 28,* 505-537.

van Holst R, van den Brink W, Veltman D & Goudriaan A (2010). Brain imaging studies in pathological gambling. *Current Psychiatry Reports, 12*, 418–425.

Vitaro F, Arsenault L & Tremblay RE (1997). Dispositional predictors of problem gambling in male adolescents. *American Journal of Psychiatry, 154*, 1759-1770.

Vitaro F, Arsenault L & Tremblay RE (1999). Impulsivity predicts problem gambling in low SES adolescent males. *Addiction, 94*, 565-575.

Vitaro F, Brendgan M, Ladouceur R & Tremblay RE (2001). Gambling, delinquency, and drug use during adolescence: Mutual influences and common risk factors. *Journal of Gambling Studies, 17*, 171-190.

Vitaro F & Bujold A (1996). Predictive and concurrent correlates of gambling in early adolescent boys. *Journal of Early Adolescence, 16*(2), 211-228.

Vitaro F, Wanner B, Ladouceur R, Brendgen M & Tremblay RE (2004). Trajectories of gambling during adolescence. *Journal of Gambling Studies, 20*, 47-69.

Volberg RA, Reitzes DC & Boles J (1997). Exploring the links between gambling, problem gambling, and self-esteem. *Deviant Behavior: An Interdisciplinary Journal, 18*, 321-342.

Vuchinich RE, Tucker JA & Harllee LM (1986, August). *Individual Differences in the Reliability of Alcoholics' Reports of Drinking.* Poster presented at the 94th Annual Convention of the American Psychological Association, Washington, D.C.

Wallace J (1993). Modern disease models of alcoholism and other chemical dependencies: The new biopsychosocial models. *Drugs & Society, 8* (1), 69-87.

Wanner B, Vitaro F, Carbonneau R & Tremblay RE (2009). Cross-lagged links among gambling, substance use, and delinquency from mid-adolescence to young adulthood: Additive and moderating effects of common risk factors. *Psychology of Addictive Behaviors, 23,* 91.

Wanner B, Vitaro F, Ladouceur R, Brendgen M & Tremblay RE (2006). Joint trajectories of gambling, alcohol and marijuana use during adolescence: A person-and variable-centered developmental approach. *Addictive Behaviors, 31*, 566-580.

Weatherly JN, Sauter JM & King BM (2004). The "big win" and resistance to extinction when gambling. *The Journal of Psychology, 138*(6), 495-504.

Welte JW, Barnes GM, Wieczorek WF, Tidwell M-C & Hoffman JH (2007). Type of gambling and availability as risk factors for problem gambling: A tobit regression analysis by age and gender. *International Gambling Studies, 7*(2), 183-198.

Westphal JR & Johnson LJ (2007). Multiple co-occurring behaviours among gamblers in treatment: Implications and assessment. *International Gambling Studies, 7*(1), 73-99.

WHO ASSIST Working Group (2002). The alcohol, smoking and substance involvement Screening Test (ASSIST): development, reliability and feasibility. *Addiction, 97* (9), 1183-1194.

Wiebe J, Single E & Falkowski-Ham A (2003). *Exploring the Evolution of Problem Gambling: A One Year Follow-Up Study*. Toronto, Ontario: Responsible Gambling Council.

Williams RJ (2003). Reliability and validity of four scales to assess gambling attitudes, gambling knowledge, gambling fallacies and ability to calculate gambling odds. *Unpublished Technical Report.* University of Lethbridge, Lethbridge, Alberta.

Williams RJ, Belanger YD & Arthur JN (2011). *Gambling in Alberta: History, Current Status, and Socioeconomic Impacts.* Final Report for the Alberta Gaming Research Institute. April 2, 2011. http://hdl.handle.net/1880/48495

Williams RJ, Rehm J & Stevens R (2011). *The Social and Economic Impacts of Gambling.* Final Report for the Canadian Consortium on Gambling Research. March 2011. https://www.uleth.ca/dspace/handle/10133/1286

Williams RJ, Royston J & Hagen B (2005). Gambling and problem gambling within forensic populations: A review of the literature. *Criminal Justice & Behavior: An International Journal 32(6),* 665-689.

Williams RJ & Volberg RA (2010). *Best Practices in the Population Assessment of Problem Gambling.* Report submitted to the Ontario Problem Gambling Research Centre. Guelph, Ontario. March 31, 2010.

Williams RJ & Volberg RA (2013). *Gambling and Problem Gambling in Ontario.* Report prepared for the Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long Term Care. June 17, 2013. https://www.uleth.ca/dspace/handle/10133/3378

Williams RJ & Volberg RA (2014). Classification Accuracy of Four Problem Gambling Assessment Instruments. *International Gambling Studies, 14* (1), 15-28.

Williams RJ, Volberg RA & Stevens RMG (2012). *Population Assessment of Problem Gambling: Methodological Influences, Standardized Rates, Jurisdictional Differences, and Worldwide Trends.* Report prepared for the Ontario Ministry of Health and Long-Term Care and the Ontario Problem Gambling Research Centre. May 8, 2012. https://www.uleth.ca/dspace/handle/10133/3068

Williams RJ, West BL & Simpson RI (2012). *Prevention of Problem Gambling: A Comprehensive Review of the Evidence, and Identified Best Practices.* Report prepared for the Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long Term Care. October 1, 2012. https://www.uleth.ca/dspace/handle/10133/3121

Williams RJ, Wood RT & Parke J (2012a). History, current worldwide situation, and concerns with Internet gambling. In *Routledge International Handbook of Internet Gambling,* RJ Wlliams, RT Wood & J Parke (eds). (pp. 3 – 26). Routledge: London.

Williams RJ, Wood RT & Parke J (2012b). *Routledge International Handbook of Internet Gambling*. Routledge: London.

Windle M & Scheidt DM (2004). Alcoholic subtypes: Are two sufficient? *Addiction, 99*(12), 1508-1519.

Winters KC, Fawkes T, Fahnhorst T, Botzet A & August G (2007). A synthesis review of exemplary drug abuse prevention programs in the United States. *Journal of Substance Abuse Treatment, 32*(4), 371-380.

Winters KC, Stinchfield RD, Botzet A & Anderson N (2002). A prospective study of youth gambling behaviors. *Psychology of Addictive Behaviors, 16*(1), 3-9.

Winters KC, Stinchfield RD, Botzet A & Slutske WS (2005). Pathways of youth gambling problem severity. *Psychology of Addictive Behaviors, 19*, 104-107.

Winters KC, Stinchfield RD & Fulkerson J (1993). Toward the development of an adolescent gambling problem severity scale. *Journal of Gambling Studies, 9*, 63–84.

Winters KC, Stinchfield RD & Kim LG (1995). Monitoring adolescent gambling in Minnesota. *Journal of Gambling Studies, 11*, 165-183.

Wohl MJA & Enzle ME (2002). The deployment of personal luck: Sympathetic magic and illusory control in games of pure chance. *Personality and Social Psychology Bulletin*, *28*(10), 1388–1397.

Wohl MJA & Enzle ME (2003a). The effects of near wins and near losses on self-perceived personal luck and subsequent gambling behavior. *Journal of Experimental Social Psychology*, *39*(2), 184–191.

Wohl MJA & Enzle ME (2003b). The effects of near wins and near losses on self-perceived personal luck and subsequent gambling behavior. *Journal of Experimental Social Psychology*, *39*(2), 184–191.

Wong IL & So EM (2003). Prevalence estimates of problem and pathological gambling in Hong Kong. *American Journal of Psychiatry, 160*(7), 1353-1354.

Wood RT & Griffiths MD (2007). A qualitative investigation of problem gambling as an escape-based coping strategy. *Psychology and Psychotherapy: Theory, Research and Practice, 80*(1), 107-125.

Wood RT & Williams RJ (2007). How much money do you spend on gambling? The comparative validity of question wordings used to assess gambling expenditure. *International Journal of Social Research Methodology: Theory and Practice, 10*(1), 63-77.

Wood RT, Williams RJ & Parke J (2012). The relationship between problem gambling and Internet gambling. In *Routledge International Handbook of Internet Gambling* by Williams RJ, Wood RT & Parke J (eds) (pp. 200-211). Routledge: London.

Xian H, Scherrer JF, Slutske WS, Shah KR, Volberg RA & Eisen SA (2007). Genetic and environmental contributions to pathological gambling symptoms in a 10-year follow-up. *Twin Research and Human Genetics, 10*, 174-179.

Xuan Z & Shaffer H (2009). How do gamblers end gambling: Longitudinal analysis of Internet gambling behaviors prior to account closure due to gambling related problems. *Journal of Gambling Studies, 25*, 239-252.

Zimmerman M, Chelminski I & Young D (2006). Prevalence and diagnostic correlates of DSM-IV pathological gambling in psychiatric outpatients. *Journal of Gambling Studies, 22*, 255-262.

APPENDICES

Appendix A: QLS Recruitment Surveys

QLS General Population Recruitment Survey

Hello, this is _____and I'm calling on behalf of the School of Health Sciences at the University of Lethbridge. We're conducting a 4 minute survey about the impact of the new Quinte Exhibition & Raceway on your community. This is a new race track with 200 slot machines that is scheduled to open in Belleville in the near future.

→ If uncertain whether person is 18 or older: We need to speak to someone in your household who is 18 years of age or older. Is that you? (Obtain respondent and reintroduce if necessary.)

→ If only some of the age x gender cells need to be filled ask for someone in one of the unfilled cells. May I please speak to anyone in your household who is.....?

	males	females
18-24	189	172
25-44	534	559
45-64	451	478
65$_+$	258	359

I first want to confirm that you live within 70 km of the city of Belleville. Is this true? (Note: this is 70 km directly, driving distance can be longer, if unclear, ask for closest town/city and/or postal code. Note: To be eligible, person has to have a 'primary residence' in the catchment area, and live at this residence at least 6 months a year).

- Yes (1)
- No (end of survey) (0)

1. Person's gender (do not ask)
- Male (1)
- Female (2)

2. Overall, would you say that the new race track with slot machines is likely to be_____to the community?
- beneficial (+1) (skip question 4)
- harmful (-1) (go to question 4)
- or neither beneficial nor harmful (0)
- Don't know/ refused (do not read) (999)

3. Which of the following do you consider to be the greatest potential benefit that this new race track with slot machines will have?
- greater employment (1)
- increased tourism (2)
- increased local or provincial revenue (3)
- support for the horse race industry (4)
- all of the above (5)
- Don't know/refused/other (do not read) (999)

4. Which of the following do you consider to be the greatest potential harm that this new race track with slot machines will have?
- increased rates of gambling addiction (1)
- increased crime or policing costs (2)
- negatively impacts people who can least afford it (3)
- greater noise or traffic problems (4)
- all of the above (5)
- Don't know/ refused/other (do not read) (999)

Now I just have a few questions about your background so we can keep track of the characteristics of people who respond to the survey. First….

5. What age range do you fall into
- 18-24 (1)
- 25-44 (2)
- 45-64 (3)
- or 65 and older (4)
- refused (999)

6. At the present are you married, living with a partner, widowed, divorced, separated, or have you never been married?
- never married (0)
- married or living with a partner (1)
- divorced, separated or widowed (2)
- refused (999)

7. What is the highest level of education you have had the opportunity to complete?_____
- less than high school (1)
- Completed high school (2)
- Some post-secondary education (3)
- trades certificate or diploma (4)
- college certificate or diploma (5)
- university degree (6)
- refused (999)

8. Are you presently working for pay in a full-time or in a part-time job or are you unemployed, retired, a homemaker, a student, or something else?
- Employed (including self-employed) part or full-time (1)
- Sick leave, maternity leave, on strike, on disability (2)
- Unemployed and seeking work (3)
- Retired (4)
- Homemaker (5)
- Full-time Student (6)
- refused (999)

9. Do you expect to still be living within 70 km of Belleville 1 year from now?
- Yes (1)
- No (0) (end of survey)
- unsure/refused (999)

10. I have one last question. Would you be interested in earning 220 dollars to participate in a research study about the impacts of the new Quinte Exhibition and Raceway? We are recruiting people and interviewing them every 9 months for 5 years to see what sort of impacts such as *[answers to questions 4 & 5]* that occur as a result of introducing slot machines into the new Quinte Race track in Belleville. We are following both gamblers and nongamblers. This is a very important research project which will help shape government gambling policy. The questionnaires could either be done at our Belleville office or over the Internet, whichever is more convenient for you. Would you be interested?

If yes, That's great. Our recommendation is to do the first questionnaire in person so that you have someone available to clarify any questions. If you do opt for Internet assessment it would be a good idea to do the questionnaire between 1pm – 9pm Tue, Wed, or Thu or 9am – 5pm Fri and Sat, when there is someone available to help you over the phone if needed. Would you like to do your first questionnaire in person or over the Internet?

- **Over Internet**: The first questionnaire will take about 1-2 hours. If you can provide me with your name and e-mail address I will e-mail you a direct link to the questionnaire and more details about this study. Your home phone number will be your USER ID. Is xxx-xxx-xxxx (contact #) your home phone number? Once you have completed the survey you will be mailed a cheque for $50. Every 9 months from now we will contact you again to do the follow-up surveys. Please expect the e-mail from Patricia McLaughlin, with 'QERI Study' stated as the subject. Thanks once again for your important contribution to this research project.

- **In Person**: Please have a pen and a piece of paper ready to take down the address to the QERI office.
  The first questionnaire will take about 1-2 hours and will occur at our Belleville office which is located in the Harbourview Plaza at 37 Pinnacle Street South (ENSURE RESPONDENTS TAKE DOWN ADDRESS). Available time slots are 1pm, 3pm, 5pm and 7pm Tuesday, Wednesday and Thursday, and 9am; 11am; 1pm; and 3pm on Friday and Saturday. What day and time would be best for you? (A maximum of 10 people can be booked for any single time slot). Please write down your appointment date, as well as the number to the QERI office in case you need to contact us for any: 1-866-969-8313. Great. I need your name, mailing address, home telephone number (check against contact number), and e-mail address. We will send you an e-mail & mail confirmation of your appointment time along with a map and a few more details about the study. Thanks once again for your important contribution to this research project.

QLS At Risk Recruitment Survey

Hello, this is _____ and I'm calling on behalf of the School of Health Sciences at the University of Lethbridge. We're conducting a 2-4 minute survey about the new Quinte Exhibition & Raceway scheduled to open in Belleville in the near future.

We would like to speak to someone in your household who is 18 years of age or older. Would that be yourself? (Obtain respondent and reintroduce if necessary. If head of household not home then ask for "any person 18 or older").

I first want to confirm that you live within 70 km of the city of Belleville. Is this true? (Note: this is 70 km directly, driving distance can be longer, if unclear, ask for closest town/city and/or postal code. Note: To be eligible, person has to have a 'primary residence' in the catchment area, and live at this residence at least 6 months a year).

1. Person's gender (do not ask)
- Male (1)
- Female (2)

E1. In the past year have you purchased any lottery or instant win tickets?
- Yes (1)
- No (0) (go to question 4)

E2. Roughly how much do you spend on lottery and instant win tickets in a typical month?_____
(MEETS ELIGIBILITY CRITERIA if spends $10 or more in a typical month)

E3. In the past year have you played bingo, casino table games, or games of skill for money against other people?
- Yes (1)
- No (0) (go to question 6)

E4. Roughly how much do you spend on bingo, casino table games, or games of skill for money in a typical month?_____
(MEETS ELIGIBILITY CRITERIA if spends $10 or more in a typical month)

E5. In the past year have you played a slot machine or bet on a horse race?
- Yes (1) (MEETS ELIGIBILITY CRITERIA)
- No (0)

E6. In the spring or summer of 2007 the new Quinte Exhibition & Raceway will open in Belleville. This is a race track with 200 slot machines. Do you think you might try playing slot machines or betting on horses when the new facility opens?
- Yes (1) (MEETS ELIGIBILITY CRITERIA)
- No (0)

Eligible if meets ¾ criteria. If not eligible, ask the following question:

E7. Is there any other adult in your household who has spent money on any of these things in the past year?
Yes (1) ("could I speak to that person" -> restart at #1)
No (0) (terminate questionnaire)

CONTINUE WITH Q2 FOR RESPONDENTS WHO MEET AT LEAST 3 ELIGIBILTY CRITERIA.

2. Overall, would you say that the new race track with slot machines is likely to be_____to the community?
- beneficial (+1) (skip question 4)
- harmful (-1) (go to question 4)
- or neither beneficial nor harmful (0)
- Don't know/ refused (do not read) (999)

3. Which of the following do you consider to be the greatest potential benefit that this new race track with slot machines will have?
- greater employment (1)
- increased tourism (2)
- increased local or provincial revenue (3)
- support for the horse race industry (4)
- all of the above (5)
- Don't know/refused/other (do not read) (999)

4. Which of the following do you consider to be the greatest potential harm that this new race track with slot machines will have?
- increased rates of gambling addiction (1)
- increased crime or policing costs (2)
- negatively impacts people who can least afford it (3)
- greater noise or traffic problems (4)
- all of the above (5)
- Don't know/ refused/other (do not read) (999)

Now I just have a few questions about your background so we can keep track of the characteristics of people who respond to the survey. First….

5. What age range do you fall into?
- 18-24 (1)
- 25-44 (2)
- 45-64 (3)
- or 65 and older (4)
- refused (999)

6. At the present are you married, living with a partner, widowed, divorced, separated, or have you never been married?
- never married (0)
- married or living with a partner (1)
- divorced, separated or widowed (2)
- refused (999)

7. What is the highest level of education you have had the opportunity to complete?_____
- less than high school (1)
- Completed high school (2)
- Some post-secondary education (3)
- trades certificate or diploma (4)
- college certificate or diploma (5)
- university degree (6)
- refused (999)

8. Are you presently working for pay in a full-time or in a part-time job or are you unemployed, retired, a homemaker, a student, or something else?

*   Employed (including self-employed) part or full-time (1)
*   Sick leave, maternity leave, on strike, on disability (2)
*   Unemployed and seeking work (3)
*   Retired (4)
*   Homemaker (5)
*   Full-time Student (6)
*   refused (999)

9. Do you expect to still be living within 70 km of Belleville 1 year from now?

*   Yes (1)
*   No (0) (end of survey)
*   unsure/refused (999)

Ask the following question to anyone who qualifies:
I have one last question. Would you be interested in earning 220 dollars to participate in a research study about the impacts of the new Quinte Exhibition and Raceway? We are recruiting people and interviewing them every 9 months for 5 years to see what sort of impacts such as *[answers to questions 4 & 5]* that occur as a result of introducing slot machines into the new Quinte Race track in Belleville. We are following both gamblers and nongamblers. This is a very important research project which will help shape government gambling policy. The questionnaires could either be done at our Belleville office or over the Internet, whichever is more convenient for you. Would you be interested?

If yes, That's great. Our recommendation is to do the first questionnaire in person so that you have someone available to clarify any questions. If you do opt for Internet assessment it would be a good idea to do the questionnaire between 1pm – 9pm Tue, Wed, or Thu or 9am – 5pm Fri and Sat when there is someone available to help you over the phone if needed. Would you like to do your first questionnaire in person or over the Internet?

*   **Over Internet**: The first questionnaire will take about 1-2 hours. If you can provide me with your name and e-mail address I will e-mail you a direct link to the questionnaire and more details about this study. Your home phone number will be your USER ID. Is xxx-xxx-xxxx (contact #) your home phone number? Once you have completed the survey you will be mailed a cheque for $50. Every 9 months from now we will contact you again to do the follow-up surveys. Please expect the e-mail from Patricia McLaughlin, with 'QERI Study' stated as the subject. Thanks once again for your important contribution to this research project.
*   **In Person**: Please have a pen and a piece of paper ready to take down the address to the QERI office.
    The first questionnaire will take about 1-2 hours and will occur at our Belleville office which is located in the Harbourview Plaza at 37 Pinnacle Street South (ENSURE RESPONDENTS TAKE DOWN ADDRESS). Available time slots are 1pm, 3pm, 5pm and 7pm Tuesday, Wednesday and Thursday, and 9am; 11am; 1pm; and 3pm on Friday and Saturday. What day and time would be best for you? (A maximum of 10 people can be booked for any single time slot). Please write down your appointment date, as well as the number to the QERI office in case you need to contact us for any: 1-866-969-8313. Great. I need your name, mailing address, home telephone number (check against contact number), and e-mail address. We will send you an e-mail & mail confirmation of your appointment time along with a map and a few more details about the study. Thanks once again for your important contribution to this research project.

QLS E-Mail Message (Online Administration)

Hello _____,

Thank you for agreeing to participate in the Quinte Exhibition and Raceway Impact Study (the QERI Project). You are one of 4,000 volunteers from the Quinte and surrounding regions who have been recruited to study what sorts of impacts occur as a result of the new Quinte Raceway in Belleville. Each person is comprehensively assessed a total of 6 times, with about 9 months between each questionnaire.

To access the survey click the following link: https://www.qeri.ca/cohort/survey. **Your USER ID is xxx-xxx-xxxx, which is the number we called when we spoke to you.** If possible, we would like you to complete the survey within 48 hours of receiving this e-mail. The questionnaire can be completed on most computers using the Internet to connect to the secure server at the University of Lethbridge. If you cannot connect on your computer, please call our Belleville Project Office and an appointment can be made for your to complete the questionnaire in the Belleville office. You can phone us at 613-969-8313 (toll free 866-969-8313) or e-mail us as info@qeri.ca . The QERI office is located at Harbourview Plaza, 37 Pinnacle Street South, in downtown Belleville. Upon completion of the questionnaire you will be mailed a cheque for $50.

Approximately every 9 months you will be contacted again and asked to do another shorter questionnaire. Your payments for each of these questionnaires will be $30; $30; $35; $35; and $40 for the last questionnaire. If you wish to learn more about this study you can go to our website at www.qeri.ca.

Thank you on behalf of Dr. Robert Williams at the University of Lethbridge and the QERI Project Team.

Patricia McLaughlin
Research Associate
QERI Project
37 Pinnacle Street South
Belleville, Ontario
K8N 3A1
patricia.mclaughlin@qeri.ca

QLS E-Mail & Mail Message (In-Person Administration)

University of Lethbridge

SCHOOL OF HEALTH SCIENCES

4401 University Drive
Lethbridge, Alberta
Canada
T1K 3M4
www.uleth.ca

Hello _____,

Thank you for agreeing to participate in the Quinte Exhibition and Raceway Impact Study (the QERI Project). You are one of 4,000 volunteers from the Quinte and surrounding regions who have been recruited to study what sorts of impacts occur as a result of the new Quinte Raceway in Belleville. Each person is comprehensively assessed a total of 6 times, with about 9 months between each questionnaire.

Your assessment time is scheduled for (time) on (day of week), (date). Our office is located at Harbourview Plaza, 37 Pinnacle Street South, in downtown Belleville (see map). **Your USER ID is xxx-xxx-xxxx, which is the number we called when we spoke to you.** If for any reason you are unable to be at the assessment, please contact our QERI office at 613-969-8313 (toll free 866-969-8313) or info@qeri.ca to re-book. The office is open 1pm – 9pm Tue – Thu, and 9am – 5pm Fri – Sat.

Upon completion of the questionnaire you will be given a cheque for $50. Approximately every 9 months later you will be contacted again and asked to do another shorter questionnaire. Your payments for each of these questionnaires will be $30; $30; $35; $35; and $40 for the last questionnaire.

If you wish to learn more about this study you can go to our website at www.qeri.ca.

Thank you on behalf of Dr. Robert Williams at the University of Lethbridge and the QERI Project Team.

Patricia McLaughlin
Research Associate
QERI Project
37 Pinnacle Street South
Belleville, Ontario; K8N 3A1
patricia.mclaughlin@qeri.ca

Dr. Robert Williams
Professor
School of Health Sciences
University of Lethbridge
Lethbridge, Alberta; T1K 3M4
Robert.williams@uleth.ca

Address:

37 Pinnacle St S
Belleville, ON, Canada
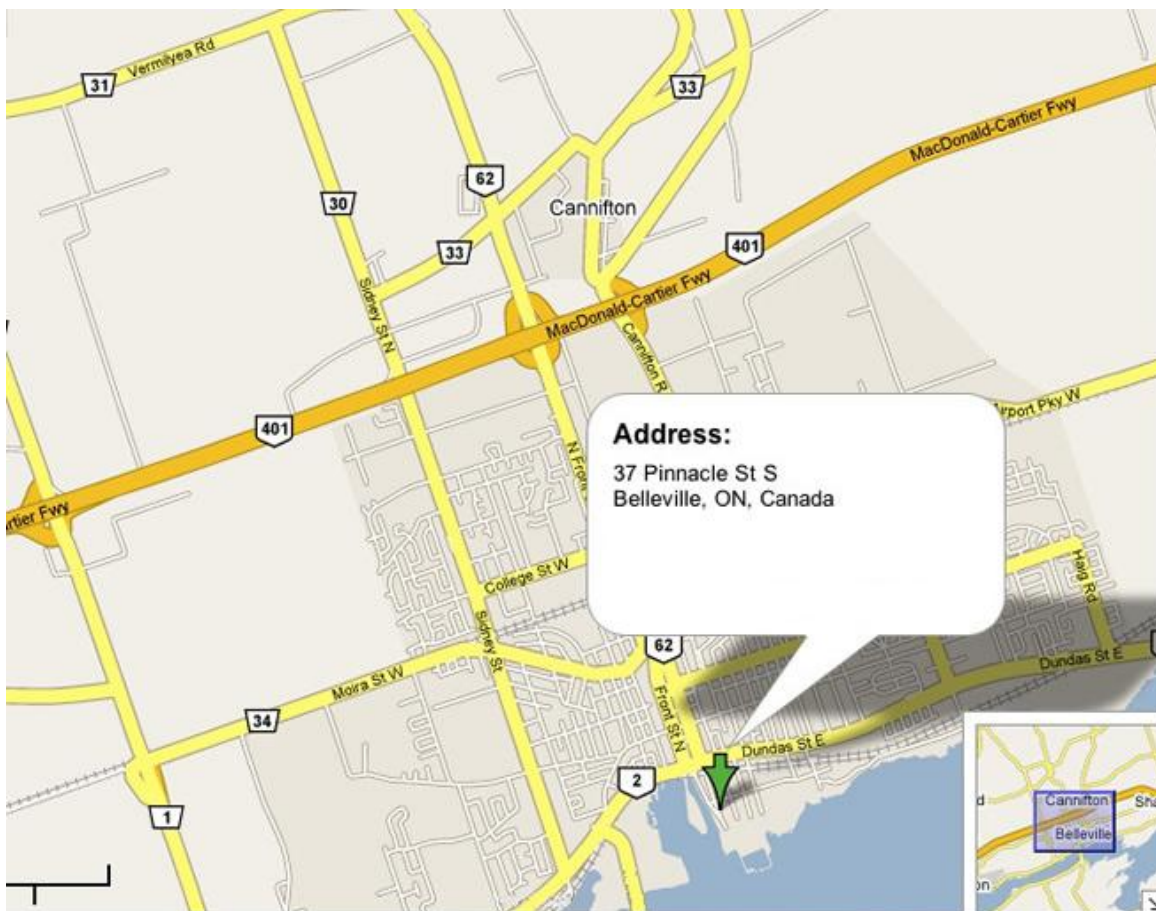
Appendix B: QLS Assessment 1 Questionnaire

INTRODUCTION

We would like you to be part of a research study about gambling. This study is looking at 2 things. The first is the social and economic impacts that occur as a result of the new Quinte Raceway Slots Facility in Belleville. The second is to determine what causes some people to gamble and other people not to, as well as what causes some people to develop gambling problems and other people not to. This is one of the largest studies of gambling ever done. The results will tell us about the overall costs versus benefits of gambling as well as what things might help prevent problem gambling.

You would be one of 4,000 people that we would follow for 5 years. Each person would be assessed 6 times during these 5 years. The first assessment will take 1-2 hours for most people. The other ones will take about 1 hour. These assessments can be done over the Internet or in front of a computer terminal at one of our QERI Research Offices. You would be paid $50 for the first assessment and a total of $220 for all 6 assessments. Between assessments we would like you to keep a record of any significant life events or any major changes in your gambling.

The information you provide will be stored as a computer data file. This file is confidential, and can only be seen by the 6 members of the international Research Team (headed by Dr. Robert Williams & Mr. Robert Hann). The local Research Team in Belleville has access to your contact information, but not to anything else. All personally identifying information will be erased from the data file once the study is finished. Also, only group results will be reported when the study is published.

This study has no known risks. However, some of the questions do ask about sensitive issues. You should also be aware that your participation is entirely voluntary and you are free to withdraw at any point. If you do withdraw, you can also choose to have your data erased.

General information about this study is on our website at www.qeri.ca. This is also where the Final Report will be posted in 2012. If you have any questions about the study you can contact our main QERI Research Office (866-969-8313 or info@qeri.ca). Questions about your rights as a participant in this research may be addressed to the Office of Research Services, University of Lethbridge (403-329-2747).

Dr. Robert Williams
Professor, School of Health Sciences
University of Lethbridge
4401 University Drive
Lethbridge, Alberta   T1K 3M4
Robert.williams@uleth.ca
403-382-7128

Mr. Robert Hann
President, Robert Hann & Associates Limited
130 Glenholme Ave., Suite 2
Toronto, Ontario   M6E 3C4
hannbob@ican.net
416-944-8892

☐ Please check this box to indicate your understanding and agreement to these conditions

Report any technical problems with this questionnaire to cody.foss@uleth.ca. If you have any other questions contact the QERI office at info@qeri.ca or 866-969-8313.

DEMOGRAPHICS

Before we start I would just like to encourage you to be as honest as possible when answering these questions, as this will really help our research. We would also like to assure you that all information provided is strictly confidential. The only information accessible by the local QERI Research Team in Belleville are questions useful for contact purposes (these have blue shading).

Please enter your USER ID to begin. Your USER ID is the telephone number we originally contacted you at (likely your home phone number). Be sure to use this exact number, otherwise you will not be able to receive payment. If you are unsure what this number is check the e-mail or mail message we sent you or contact the QERI office at 866-969-8313 or info@qeri.ca .

USER ID_____-_____-_____ (limited to area codes starting with 000, 613, 705, 905)

The survey takes between 1-2 hours for most people. Our preference is that you finish it in one sitting. However, if you wish to take a break you can click Save this survey and resume later (at the bottom of every screen). To resume you will need to re-enter your USER ID as well as a Password. You can use this automatically generated password, or create your own. **Write this information down**. Without it, you may have to start the survey over.

D1. Name
- First_____ Middle Initial_____ Last_____
- Preferred First Name (if different from above)_____

D2. Gender
- Male (1)
- Female (2)

D3. Birth Date
Day_____ Month_____ Year_____

D4. Current Home Mailing Address (separate fields for town/city and full postal code)

D5a. Current Home Phone Number

D5b. Current Cell Phone Number

D5c. Current Home e-mail

D6. What country were you born in?
- drop-down menu with all countries listed (Canada first)

D7. How long have you lived in the Quinte area?
- less than 1 year (1)
- 1-3 years (2)
- 4-6 years (3)
- more than 6 years (4)

D8. What are the main ethnic or cultural origins of your ancestors?
- Aboriginal, Inuit or Métis (1)
- African (2)
- Asian (Eastern) (*e.g., Vietnamese, Cambodian, Chinese, Korean, Japanese, Indonesian, Laotian, etc.)* (3)
- Asian (Southern) (*e.g., East Indian, Pakistani, Sri Lankan, etc.)* (4)
- Asian (Western) (*e.g., Iranian, Afghan, etc.)* (5)
- European (Eastern) *(e.g., Russian, Ukrainian, Romanian, etc.) (6)*
- European (Western) *(e.g. British, Irish, Scottish, French, Italian, German, Scandinavian, etc.)* (7)
- Latin American (Mexican, Central American, South American) (8)
- Other_____ (9)

D9. Were you adopted?
- no (0)
- yes (1) (go to D11)
- unsure (9999)

D10. What was your birth order?
- first born (1)
- second born (2)
- third born (3)
- fourth born (4)
- fifth born (5)
- sixth or later born (6)
- unsure (9999)

D11. Whom were you primarily raised by?
- my biological parents (1)
- my adoptive parents (2)
- single parent (mother) (3)
- single parent (father) (4)
- 1 biological parent + 1 step-parent (5)
- other relatives (6)
- other nonrelatives (7)
- Other_____ (8)

D12. What is the highest level of education you have completed?_____
- No schooling (0)
- Some elementary school (1)
- Completed elementary school (2)
- Some high school (3)
- Completed high school (4)
- Some technical school, college or university (5)
- Completed technical school (6)
- Completed college or university (7)
- Professional Degree (Law, Medicine, Dentistry); Masters or PhD (8)

D13. What is your current marital status?
- never married (0)
- married (1)
- living common-law (2)
- separated (3)
- divorced (4)
- widowed (5)

D14a. Do you have any children?
- yes (1)
- no (0) (go to D15)

D14b. Age and gender of your biological children
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____

D14c. Age and gender of adopted or step-children
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____
age_____ gender _____

D15. How many adults (18+), including yourself, currently live in your household?
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 or more (7)

D16a. Your Current Employment
- Unemployed (0) (go to D17)
- Retired (1) (go to D17)
- Homemaker (2) (go to D17)
- Full-time Student (3) (go to D17)
- Sick leave, maternity leave, on strike, on disability (4) (go to D17)
- Employed part-time (5)
- Employed full-time (6)

D16b. Name of Current Employer and Work Address (separate line for postal code; although postal code not mandatory for moving on to next question)

D16c. Current Occupation_____

D16d. Work phone number

D16e. Work e-mail

D17. To the nearest thousand dollars, what do you estimate your total household income before taxes was last year?
- less than $20,000 (1)
- between $20,000 and $29,999 (2)
- between $30,000 and $39,999 (3)
- between $40,000 and $49,999 (4)
- between $50,000 and $59,999 (5)
- between $60,000 and $69,999 (6)
- between $70,000 and $79,999 (7)
- between $80,000 and $89,999 (8)
- between $90,000 and $99,999 (9)
- between $100,000 and $119,999 (10)
- between $120,000 and $149,999 (11)
- more than $150,000 (12)
- unsure (9999)

D18. To the nearest thousand dollars, what do you estimate your current TOTAL household DEBT to be? This would include the amount owing on mortgages, credit cards, loans, car payments, etc.? drop down menu starting from less than$1000, $2000, $3000, $4000, $5000, $6000, $7000, $8000, $9000, $10000; $12K, 14K, 16, 18, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1 million, more than 1 million, unsure)

D19. If we need to contact you over the 5-year term of this study and we cannot reach you directly with the information you have given, is there someone else that could assist us in contacting you? **No information about the study will ever be given to that person.** They will simply be asked "We are trying to contact (your name) and (your name) had told us that you might be able to assist us if they moved or changed their phone number". Notify one of the Research Assistants if you need a phone book or some other assistance with this.
Name_____   Name_____
Home Phone Number_____   Home Phone Number_____
Cell Phone Number_____   Cell Phone Number_____
e-mail_____e-mail_____

PHYSICAL HEALTH

H1a. Do you have any physical disability or chronic health problem that limits the amount or kind of activity you can do at home, work or school?
- Yes (1)
- No (0) (go to H2)

H1b. What is your physical disability or chronic health problem?
_____

H2. How would you rate your general physical health in the past 12 months?
- Excellent (6)
- very good (5)
- good (4)
- fair (3)
- poor (2)
- very poor (1)

H3. About how often have you visited a doctor, clinic or hospital in the past 12 months?
- Once or twice a week (4)
- Once or twice a month (3)
- Once every couple of months (2)
- Once or twice (1)
- not at all (0)

H4. About how often have you exercised in the past 12 months (i.e., 30 minutes of continuous physical activity, and would include things such as walking, gardening, etc.)?
- 4 or more times a week (5)
- 2-3 times a week (4)
- once a week (3)
- a few time a month (2)
- rarely (1)
- not at all (0)

H5a. What is your current height in inches?
- drop down menu from 4'8" to 7'0"

H5b. What is your current weight in pounds_____?

H6a. Are you currently taking any prescription medications?
- Yes (1)
- No (0) (go to next SECTION)

H6b. Indicate what are each of these medications are for and when you started them. If you are unsure, just write 'unsure' in the box.
medication_____ purpose_____ start date_____
medication_____ purpose_____ start date_____
medication_____ purpose_____ start date_____
medication_____ purpose_____ start date_____

GAMBLING

Gambling is defined as wagering money or material goods on something with an uncertain outcome in the hopes of winning additional money or material goods. It includes things such as lottery tickets, scratch 'n win tickets, bingo, betting against a friend on a game of skill or chance, investing in high risk stocks, etc.

GAMBLING ATTITUDES MEASURE (Williams, 2003)

GA1. Which best describes your belief about the benefit or harm that gambling has for society?
- The harm far outweighs the benefits (-2)
- The harm somewhat outweighs the benefits (-1)
- The benefits are about equal to the harm (0)
- The benefits somewhat outweigh the harm (+1)
- The benefits far outweigh the harm (+2)
- unsure (0)

GA2. Do you believe that gambling is morally wrong?
- No (+1)
- Yes (-1)
- Unsure (0)

GA3. Which of the following best describes your opinion about legalized gambling?
- all types of gambling should be legal (+1)
- some types of gambling should be legal (e.g., lotteries) and some should be illegal (e.g., slot machines). (0)
- all types of gambling should be illegal. (-1)
- you are unsure or don't know (0)

GATOTAL (composite variable created in SPSS dataset)

LIFETIME GAMBLING

GL1. Check off gambling activities you have ever done in your lifetime
- ☐ Purchased a **lottery ticket**
- ☐ Purchased an **instant win ticket** (e.g., scratch & win, pull tabs, breakopens, Nevada tickets)
- ☐ Played **bingo** for money
- ☐ Played **slot machines or other electronic gambling machines** (VLTs, electronic bingo, pachinko, electronic keno, fruit machines, etc.)
- ☐ Played **casino table games** for money (i.e., blackjack, baccarat, roulette, craps, etc.)
- ☐ Played **games of skill for money** against other people (e.g., poker, pool, darts, bowling, video games, board games, strategy games, checkers, mah-jong, etc.)
- ☐ Bet on a **horse or dog race**
- ☐ Bet on a **sporting event**
- ☐ Purchased high **risk stocks, options, futures, or day traded** on the stock market
- ☐ Other_____

go to GAMBLING SOCIAL EXPOSURE SECTION if person answers no to all questions

GL2. At what age do you recall first gambling for money? _____

GL3. Prior to age 19 how often did you gamble?
- never (0) (go to GL5a)
- once or twice (1)
- several times (2)
- regularly (3)
- unsure (9999)

GL4. Do you recall having a big gambling win or a big gambling loss prior to age 19?
- No (0)
- yes, a big win (1)
- yes, a big loss (2)
- yes, a big win and a big loss (3)

GL5a. Were any of your parents, brothers, or sisters regular gamblers when you were growing up?
- Yes (1)
- no (0) (go to GL6a)
- unsure (9999)

GL5b. Check off which ones.
____mother (1)
____father (2)
____brother (s) (3)
____sister (s) (4)

GL5c. Did they ever gamble with you?
- No (0)
- yes, occasionally (1)
- yes, regularly (2)
- unsure (9999)

GL5d. Were any of these people 'problem gambler(s)'? Note: Someone is a 'problem gambler' if *significant* problems (e.g., psychological, health, financial, school/employment, social, illegal activity) have occurred to the individual, someone in the person's immediate social network, or for the person's community as a consequence of that person's gambling.
- Yes (1)
- no (0) (go to GL6a)
- unsure (9999) (go to GL6a)

GL5e.   Check off which ones
____mother (1)
____father (2)
____brother (s) (3)
____sister (s) (4)

GL6a. In your lifetime, what is the largest amount of money you recall having ever lost to gambling in a single day?
-$_____

GL6b. What did you lose the money on?
- Lottery (1)
- Instant win ticket (2)
- Bingo (3)
- Slot machines or other electronic gambling machines (4)
- Casino table games (i.e., blackjack, baccarat, roulette, craps, etc.) (5)
- Games of skill against other people (e.g., poker, pool, darts, bowling, video games, board games, strategy games, checkers, mah-jong, etc.) (6)
- Horse or dog racing (7)
- Sports Betting (8)
- High risk stocks, options, futures, or day trading (9)
- Other_____ (10)

GL6c. What is your best estimate about how many years ago this occurred?
- in the past year (1)
- 2 years ago (2)
- 3 years ago (3)
- 4 years ago (4)
- 5 years ago (5)
- 6 years ago (6)
- 7 years ago (7)
- 8 years ago (8)
- 9 years ago (9)
- 10 years ago (10)
- more than 10 years ago (11)

GL7a. In your lifetime, what is the largest amount of money you recall winning from gambling in a single day?
+$_____

GL7b. What did you win the money on?
- Lottery (1)
- Instant win ticket (2)
- Bingo (3)
- Slot machines or other electronic gambling machines (4)
- Casino table games (i.e., blackjack, baccarat, roulette, craps, etc.) (5)
- Games of skill against other people (e.g., poker, pool, darts, bowling, video games, board games, strategy games, checkers, mah-jong, etc.) (6)
- Horse or dog racing (7)
- Sports Betting (8)
- High risk stocks, options, futures, or day trading (9)
- Other_____ (10)

GL7c. What is your best estimate about how many years ago this occurred?
- past year (1)
- 2 years ago (2)
- 3 years ago (3)
- 4 years ago (4)
- 5 years ago (5)
- 6 years ago (6)
- 7 years ago (7)
- 8 years ago (8)
- 9 years ago (9)
- 10 years ago (10)
- more than 10 years ago (11)

GL8. What is your best estimate about your lifetime net loss (or win) on gambling? -$_____

GL9. Do you have any lifetime history of problem gambling? Note: Someone is a 'problem gambler' if *significant* problems (e.g., psychological, health, financial, school/employment, social, illegal activity) have occurred to the individual, someone in the person's immediate social network, as a consequence of that person's gambling.
- no (0) (go to next SECTION)
- yes (1)
- unsure (9999)

GL10. Have you had these problems in the past year?
- no (0)
- yes (1)

GL11. Have you overcome these problems?
- no (0) (go to next SECTION)
- yes, partially (1) (go to next SECTION)
- yes (2)

GL12. How did you overcome your gambling problems?

GL (variable created programmatically; gambled in lifetime)

PAST YEAR GAMBLING BEHAVIOUR

(Wordings based on the research of Wood & Williams (2007).

GY1a. In the past 12 months, how often have you purchased **lottery tickets**? Would you say about
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY2a and score GY1b as '0')

GY1b. Roughly how much money do you spend on lottery tickets in a typical month? ('spend' means how much you are ahead (+$) or behind (-$), or your net win or loss in an average month in the past 12 months).
-$_____ (negative sign can be removed and replaced with positive sign)

GY2a. In the past 12 months, how often have you purchased **instant win tickets** such as scratch & win, pull tabs, breakopens, or Nevada tickets? ('spend' means how much you are ahead (+$) or behind (-$), or your net win or loss in an average month in the past 12 months).   Would you say
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY3a and score GY2b as '0')

GY2b. Roughly how much money do you spend on instant win tickets in a typical month? -$_____

GY3a. In the past 12 months, how often have you played bingo for money? Would you say
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY4a and score GY3b as '0')

GY3b. Roughly how much money do you spend on bingo in a typical month? -$_____

GY4a. In the past 12 months, how often have you played **slot machines, video lottery terminals, or other electronic gambling machines** for money? Would you say
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY5a and score GY4b as '0')

GY4b. Roughly how much money do you spend on slot machines, video lottery terminals, or other electronic gambling machines in a typical month? -$_____

GY4c. Where do you <u>normally</u> go to play slot machines, video lottery terminals, or other electronic gambling machines? (check off as many that apply)
- Ontario Race tracks with slots
    - ___Ajax Downs (1)
    - ___Flamboro Downs (2)
    - ___Georgian Downs (3)
    - ___Kawartha Downs in Fraserville (4)
    - ___Mohawk Raceway (5)
    - ___Rideau Carleton Raceway (7)
    - ___Woodbine Race track (8)
- Ontario Casinos
    - ___Casino Rama (11)
    - ___Casino Niagara (12)
    - ___Great Blue Heron Charity Casino (13)
    - ___Niagara Fallsview (14)
    - ___Thousand Island Charity Casino in Gananoque (15)
- Other Province Casinos
    - ___Quebec Casinos (16)
    - ___Casinos in Other Provinces (17)
- U.S. Casinos
    - ___Las Vegas/Reno (18)
    - ___Casinos in Other States (19)
- ___Casinos in other Countries (other than U.S.) (20)
- ___Internet (9)
- Other_____ (10)

GY5a. In the past 12 months, how often have you played **casino table games** for money (i.e., blackjack, baccarat, roulette, craps, etc.)? Would you say
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY6a and score GY5b as '0')

GY5b. Roughly how much money do you spend on casino table games in a typical month? -$_____

GY6a. In the past 12 months, how often have you played games of skill for money against other individuals (e.g., poker, pool, darts, bowling, video games, board games, strategy games, checkers, mah-jong, etc.)? Would you say
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY7a and score GY6b as '0')

GY6b. Roughly how much money do you spend playing games of skill for money against other individuals in a typical month?   -$_____

GY7a. In the past 12 months, how often have you bet money on sporting events?
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY8a and score GY7b as '0')

GY7b. Roughly how much money do you spend on sports betting in a typical month? -$_____

GY8a. In the past 12 months, how often have you bet money on horse or dog racing?
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY9a and score GY8b as '0')

GY8b. Roughly how much money do you spend on horse or dog racing in a typical month? -$_____

- Ontario Race tracks
  - ___Ajax Downs (1)
  - ___Flamboro Downs (2)
  - ___Georgian Downs (3)
  - ___Kawartha Downs in Fraserville (4)
  - ___Mohawk Raceway (5)
  - ___Quinte Exhibition and Raceway (6)
  - ___Rideau Carleton Raceway (7)
  - ___Woodbine Race track (8)
- Ontario Teletheatres (simulcast or inter-track wagering)
  - ___Teletheatre in Ajax (11)
  - ___Teletheatre in Arnprior (12)
  - ___Teletheatre in Brockville (13)
  - ___Teletheatre in Cardinal (14)
  - ___Teletheatre in Cobourg (15)
  - ___Teletheatre in Kingston (16)
  - ___Teletheatre in Napanee (17)
  - ___Teletheatre in Oshawa (18)
  - ___Teletheatre in Peterborough (19)
  - ___Other Ontario Race tracks (20)
- ___Quebec Race tracks (21)
- ___U.S. Race tracks (22)
- ___Internet (e.g., Horse Player Interactive) (9)
- ___Other_____ (10)

GY9a. In the past 12 months, how often did you purchase high risk stocks, options or futures or day trade on the stock market?
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY10a and score GY9b as '0')

GY9b. What do you estimate is your net loss or gain in a typical month from high risk stocks, options, futures, or day trading? -$_____ or +$_____

GY10a. In the past 12 months have you engaged in other forms of gambling that haven't been mentioned?
- Yes (1)
- No (0) (go to GY11a)

GY10b. What are these forms?_____

GY10c. In the past 12 months, how often did you participate in these other forms of gambling?
- 4 or more times a week (20)
- 2-3 times a week (10)
- once a week (4)
- 2-3 times a month (2.5)
- once a month (1)
- less than once a month (.5)
- not at all (0) (Go to GY11a and score GY10b as '0')

GY10d. Roughly how much money do you spend on these other forms of gambling in a typical month? -
$_____

GY11a. In the past 12 months, what is the largest amount of money you have ever lost to gambling in a single day?
-$_____

GY11b. What did you lose the money on?
- Lottery (1)
- Instant win ticket (2)
- Bingo (3)
- Slot machines or other electronic gambling machines (4)
- Casino table games (i.e., blackjack, baccarat, roulette, craps, etc.) (5)
- Games of skill against other people (e.g., poker, pool, etc.) (6)
- Horse or dog racing (7)
- Sports Betting (8)
- High risk stocks, options, futures, or day trading (9)
- Other_____ (10)

GY12a. In the past 12 months, what do you recall your largest gambling winning on a single day to be?
+$_____

GY12b. What did you win the money on?
- Lottery (1)
- Instant win ticket (2)
- Bingo (3)
- Slot machines or other electronic gambling machines (4)
- Casino table games (i.e., blackjack, baccarat, roulette, craps, etc.) (5)
- Games of skill against other people (e.g., poker, pool, etc.) (6)
- Horse or dog racing (7)
- Sports Betting (8)
- High risk stocks, options, futures, or day trading (9)
- Other_____ (10)

GY13a. Do you personally use the Internet at home?
- yes (1)
- no (0)

GY13b. In the past 12 months have you done any gambling over the Internet for money?
- yes (1)
- no (0) (go to next SECTION)

GY13c. Roughly what percentage of your gambling has been done over the Internet in the past 12 months?
_____%

GYACTIVITIES (composite variable created programmatically; total number of different gambling activities engaged in in the past 12 months).

GYFREQUENCY (composite variable created programmatically; total days gambling on all forms in past month/adding up all frequency codes for all forms)

GYSPEND (composite variable created programmatically; total monthly expenditure on all forms)

GY (composite variable created in SPSS dataset; gambled in past year: 0=no (GYFREQUENCY & GYSPEND = 0); 1 = Yes)

Go to GAMBLING SOCIAL EXPOSURE SECTION if person has not gambled in past 12 months (GYFREQUENCY AND GYSPEND = 0)

GAMBLING MOTIVATION

GM1. What would you say is the main reason that you gamble?
- excitement/entertainment/fun (1)
- to win money (2)
- to escape or distract myself (3)
- to socialize (4)
- to support worthy causes (5)
- it makes me feel good about myself (6)
- other_____ (7)

GAMBLING CONTEXT

The following 4 questions are not asked of people who only purchase lottery or instant win tickets.

GC1. In the past 12 months have you typically gambled alone or with friends/family?
- always alone (1)
- mostly alone (2)
- sometimes alone and sometimes with friends/family (3)
- occasionally alone but usually with friends/family (4)
- always with friends/family (5)

GC2. How often do you drink alcohol when you gamble (past 12 months)?
- always (4)
- often (3)
- sometimes (2)
- rarely (1)
- never (0)

GC3. How often do you smoke or use tobacco when you gamble (past 12 months)?
- always (4)
- often (3)
- sometimes (2)
- rarely (1)
- never (0)

GC4. How often do you use drugs when you gamble (past 12 months)? (i.e., marijuana, hashish, LSD, PCP, ecstasy, cocaine, crack, heroin, or any other street drugs).
- always (4)
- often (3)
- never (0)
- sometimes (2)
- rarely (1)

GAMBLING SOCIAL EXPOSURE

GE1a. How many of your close friends and family members are regular gamblers?
- None (0)
- One (1)
- a few of them (2)
- many of them (3)
- all of them (4)
- unsure (9999)

GE1b. How many of your close friends and family members would you say have had gambling problems in the past 12 months? Note: Someone is a 'problem gambler' if *significant* problems (e.g., psychological, health, financial, school/employment, social, illegal activity) have occurred to the individual, someone in the person's immediate social network as a consequence of that person's gambling.
- None (0)
- One (1)
- a few of them (2)
- many of them (3)
- all of them (4)
- unsure (9999)

GE2a. How many adults living in your household (not including yourself) would you say have had gambling problems in the past 12 months?
- 0 (go to GE3)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 or more (5)
- unsure (9999)

GE2b. What is their relationship to you? (i.e., wife/husband, son/daughter, friend, etc.)?_____

GE3. How available are opportunities to gamble at your workplace (or school)?
- not available (0)
- available on occasion (1)
- readily available if you seek them out (2)
- readily available (3)
- unsure or not applicable (9999)

GE4. Have you been exposed to any problem gambling prevention or awareness campaigns at your workplace (or school) in the past 12 months?
- no (0)
- yes (1)
- unsure or not applicable (9999)

QUINTE EXHIBITION AND RACEWAY

GQ1. Are you aware of the new Quinte Exhibition and Raceway that is slated to open in Belleville in the spring or summer of 2007? (It is a Raceway and Exhibition centre with 200 slot machines located next to Highway 401).
- yes (1)
- no (0)

GQ2. What sort of overall impact do you believe the new Quinte Exhibition and Raceway is likely to have for the Quinte region?
- very beneficial (+2)
- somewhat beneficial (+1)
- neither beneficial nor harmful (0)
- somewhat harmful (-1)
- very harmful (-2)
- don't know/unsure (9999)

GQ3. What would you say are the likely major benefits, if any, of this facility? (Indicate up to 3 benefits).

_____
_____
_____

GQ4. What would you say are the likely major drawbacks/problems, if any, of this facility? (Indicate up to 3 drawbacks/problems).

_____
_____
_____

GQ4a. For each category, put a check in the box that shows the impact you believe the new QER will have in the Quinte region:

	Very positive	Positive	Neutral	Negative	Very negative
Employment opportunities					
Gambling addictions					
Tourism & hospitality businesses					
Other Quinte businesses (nontourism or hospitality)					
Moral values					
Local government revenue					
Crime and community safety					
Horse racing industry					
Traffic congestion					
Keeping gambling $ from being spent outside of the region					
Community image					
Donations and grants to local charities					
Entertainment options					

GQ5. How many times have you gone to the <u>existing</u> Quinte Raceway and Exhibition in the past 12 months (for racing, exhibitions or events)?

- Not at all (0 times) (0) (go to next SECTION)
- Only a few days (1 - 5 times per year) (1)
- Once a month or less (6 - 12 times per year) (2)
- Several times a month (3 - 5 times per month) (3)
- Several times a week (6 - 29 times per month) (4)
- Daily (30+ times per month) (5)

GQ6a. On average, how much would you estimate you spend per visit? -$_____

GQ6b. Check off the things that you spend this money on.
____horse race betting (2)
____food and/or alcohol (3)
____events/exhibitions held at QER (4)
____other_____ (5)

GQ11. When you visit the QER, do you spend money on hotels, motels, outside restaurants, shopping, or other Belleville attractions as part of your visit?

- Never (0) (go to next SECTION)
- About 25% of the time (1)
- About 50% of the time (2)
- About 75% of the time (3)
- Always (4)

GQ12. Roughly how much do you typically spend on these things per visit, when you do spend money on them as part of your trip to QER?

- Hotels/motels $_____
- Outside restaurants $_____
- Shopping $_____
- Other Belleville attractions $_____

Only ask the PROBLEM GAMBLING SECTION for people who had a GYFREQUENCY score of 3 or more OR a GYSPEND amount of plus or minus $10. NOTE: people with no lifetime history of gambling get GYFREQUENCY and GYSPEND scores of 0.

PROBLEM GAMBLING
(Canadian Problem Gambling Index (CPGI) (Ferris & Wynne, 2001); Problem and Pathological Gambling Measure (PPGM) (Williams & Volberg, 2014, 2010); NORC DSM-IV Past Year Gambling Screen (NODS) (Gerstein et al., 1998). Please answer each of the following 23 questions, even if none of them apply to you.

GP1. CPGI1. Thinking about the past 12 months, have you bet more than you could really afford to lose? Would you say:

- never (0)
- sometimes (1)
- most of the time (2)
- almost always (3)
- don't know (9999)

GP2. CPGI2. Thinking about the past 12 months, have you felt guilty about the way you gamble or what happens when you gamble? Would you say:
- never (0)
- sometimes (1)
- most of the time (2)
- almost always (3)
- don't know (9999)

GP3. CPGI3/PPGM11/NODS2. In the past 12 months, have you needed to gamble with larger amounts of money to get the same feeling of excitement? Would you say:
- never (0)
- sometimes (1)
- most of the time (2)
- almost always (3)
- don't know (9999)

GP4. CPGI4/PPGM8b/NODS6. In the past 12 months, when you gambled, did you go back another day to try to win back the money you lost? Would you say
- never (0)
- sometimes (1)
- most of the time (2)
- almost always (3)
- don't know (9999)

GP5. CPGI5/PPGM1a/NODS10. In the past 12 months, have you borrowed money or sold anything to get money to gamble? Would you say
- never (0)
- sometimes (1)
- most of the time (2)
- almost always (3)
- don't know (9999)

GP6. CPGI6/PPGM1b. In the past 12 months, has your gambling caused any financial problems for you or your household? Would you say:
- never (0)
- sometimes (1)
- most of the time (2)
- almost always (3)
- don't know (9999)

GP7. CPGI7. In the past 12 months, has your gambling caused you any health problems, including stress or anxiety? Would you say:
- never (0)
- sometimes (1)
- most of the time (2)
- almost always (3)
- don't know (9999)

GP8. CPGI8. In the past 12 months, have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true? Would you say:

- never (0)
- sometimes (1)
- most of the time (2)
- almost always (3)
- don't know (9999)

GP9. CPGI9. In the past 12 months, have you felt that you might have a problem with gambling? Would you say

- never (0)
- sometimes (1)
- most of the time (2)
- almost always (3)
- don't know (9999)

GP10. PPGM2. Has your involvement in gambling caused significant mental stress in the form of guilt, anxiety, or depression for you or someone close to you in the past 12 months?

- no (0)
- yes (1)

GP11. PPGM3a/NODS9a. Has your involvement in gambling caused significant problems in your relationship with your spouse/partner or important friends or family in the past 12 months?

- no (0)
- yes (1)

GP12. PPGM3b. Has your involvement in gambling caused you to repeatedly neglect your children or family in the past 12 months? (Yes/No)

GP13. PPGM4. Has your involvement in gambling caused significant health problems for you or someone close to you in the past 12 months?

- no (0)
- yes (1)

GP14. PPGM5/NODS9b/NODS9c. Has your involvement in gambling caused significant work or school problems for you or someone close to you in the past 12 months or caused you to miss a significant amount of time off work or school?

- no (0)
- yes (1)

GP15. PPGM6/NODS8. Has your involvement in gambling caused you or someone close to you to write bad cheques, take money that didn't belong to you or commit other illegal acts to support your gambling in the past 12 months?

- no (0)
- yes (1)

GP16. PPGM7. Is there anyone else who would say that your involvement in gambling in the past 12 months has caused significant problems, regardless of whether you agree with them or not?

- no (0)
- yes (1)

GP17. PPGM8a. Have you often gambled longer, with more money or more frequently than you intended to in the past 12 months?
- no (0)
- yes (1)

GP18a. PPGM8c/NODS3a. In the past 12 months, have you made attempts to either cut down, control or stop gambling?
- no (0) (go to GP19b)
- yes (1)

GP18b. PPGM8d/NODS4. Were you successful in these attempts?
- no (1)
- yes (0)

GP19a. PPGM9a/NODS3b. In the past 12 months, when you did try cutting down or stopping did you find you were very restless or irritable or that you had strong cravings for it?
- no (0)
- yes (1)

GP19b. PPGM9b. In the past 12 months, have you had strong cravings for gambling?
- no (0)
- yes (1)

GP20. PPGM12. In the past 12 months, is there anyone else who would say that you had strong cravings for gambling or had a loss of control over your gambling, regardless of whether you agreed with them or not?
- no (0)
- yes (1)

GP21. PPGM10/NODS1a/NODS1b. In the past 12 months, would you say you have been preoccupied with gambling?
- no (0)
- yes (1)

GP22a. NODS5a. In the past 12 months, have you gambled as a way to escape from personal problems?
- no (0)
- yes (1)

GP22b. NODS5b. In the past 12 months, have you gambled to relieve uncomfortable feelings such as guilt, anxiety, helplessness, or depression?
- no (0)
- yes (1; unless already have a 1 for GP21a)

GP23. NODS7. In the past 12 months, have you lied to family members, friends, or others 3 or more times about how much you gamble or how much money you lost on gambling?
- no (0)
- yes (1)

Following questions only asked if person scores 3 or more on the CPGI or if report being a past year problem gambler on GL10.

GP24. Are there particular types of gambling that have contributed to your problems more than others?
- no (0) (go to GP26)
- yes (1)

GP25. Check off which ones
____Lotteries (1)
____Instant win tickets (2)
____Bingo (3)
____Slot machines or other electronic gambling machines (4)
____Casino table games (i.e., blackjack, baccarat, roulette, craps, etc.) (5)
____Games of skill against other people (e.g., poker, pool, etc.) (6)
____Horse or dog racing (7)
____Sports Betting (8)
____High risk stocks, options, futures, or day trading (9)
____Other_____ (10)

GP26. What would you say has caused your gambling problems?

GP27a. Have you ever sought help for gambling problems?
- yes (1)
- no (0) (go to next SECTION)

GP27b. Where did you seek help from?
- friends (1)
- family (2)
- Gambler's Anonymous (3)
- family doctor (4)
- psychologist (5)
- psychiatrist (6)
- counselling service (7)
- pastor/minister/priest/etc. (8)
- telephone help/hotline (9)
- other_____ (10)

GP27c. What was the nature of the help or treatment you received?

PPGMTOTAL (composite variable created in SPSS dataset)

PPGMCATEGORIES (composite variable created in SPSS dataset)

CPGITOTAL (composite variable created in SPSS dataset)

CPGITOTAL_2 (composite variable created in SPSS dataset; CPGITOTAL + 0.5 for cases displaying 1 or more 9999 ('unsure') responses, to reflect that such responses reflect some meaning/value)

CPGICATEGORY (variable created in SPSS dataset; source variable CPGITOTAL) (0=NON-PROBLEM GAMBLER (CPGITOTAL=0); 1=LOW RISK GAMBLER (CPGITOTAL=1-2); 2=MODERATE PROBLEM GAMBLER (CPGITOTAL=3-7); 3=SEVERE PROBLEM GAMBLER (CPGITOTAL $\geq$8)

NODSTOTAL (composite variable created in SPSS dataset)

NODSTOTAL_2 (composite variable created in SPSS dataset; NODSTOTAL + 0.5 for cases displaying 1 or more 9999 ('unsure') responses, to reflect that such responses reflect some meaning/value)

NODSTYPOLOGY (variable created in SPSS dataset; source variable NODSTOTAL) (0=TYPE B/NON-PROBLEM GAMBLER (NODSTOTAL=0); 1=TYPE C/LOW RISK GAMBLER (NODSTOTAL=1-2); 2=TYPE D/POSSIBLE PATHOLOGICAL GAMBLER OR PROBLEM GAMBLER (NODSTOTAL=3-4); 3=TYPE E/PROBABLE PATHOLOGICAL GAMBLER (NODSTOTAL≥5)

GAMBLING BELIEFS AND KNOWLEDGE (GAMBLING FALLACIES MEASURE) (Williams, 2003)[42]

GF1. Which of the following set of Lottery numbers would you say has the greatest probability of being selected as the winning combination?
- The first set of numbers is 1, 2, 3, 4, 5, 6 (0)
- The second set of numbers is 14, 43, 5, 32, 17, 47, (0)
- or would you say that both sets have an equal probability of being selected (1)

GF2. Which gives you the best chance of winning the jackpot on a slot machine?
- a slot machine that has not had a jackpot in over a month, or (0)
- a slot machine that had a jackpot an hour ago, or would you say that (0)
- Your chances of winning the jackpot are the same on both machines. (1)

GF3. How lucky are you? If 10 people's names were put into a hat and one name drawn for a prize, how likely is it that your name would be chosen?
- About the same likelihood as everyone else (1)
- Less likely than other people, (0)
- More likely than other people, or, (0)

GF4. If you were to buy a lottery ticket, which would be the best place to buy it from?
- a place that has sold many previous winning tickets, (0)
- a place that has sold few previous winning tickets (0)
- one place is as good as another (1)

GF5. A positive attitude increases your likelihood of winning money when playing bingo or slot machines. Do you agree or disagree?
- Agree (0)
- Disagree (1)

GF6. A gambler goes to the casino and comes out ahead 75% of the time. How many times has he or she likely gone to the casino?
- 4 times (1)
- 100 times (0)
- it is just as likely that he has gone either 4 or 100 times (0)

GF7. Which strategy gives you the best chance of doubling your money at the casino?
- Betting all your money on a single bet, (1)
- Betting small amounts of money on several different bets (0)
- Either strategy gives you an equal chance of doubling your money (0)

---

[42] This section of the questionnaire was labelled as Gambling Beliefs and Knowledge (rather than Gambling Fallacies).

GF8. Which game can you consistently win money at if you use the right gambling strategy?
- Slot machines, or (0)
- Roulette, or (0)
- Bingo, or (0)
- None of these games (1)

GF9. Do you think your chances of winning a lottery are better if you are able to choose your own numbers?
- yes (0)
- no (1)

GF10. You are on a betting hot streak. You have flipped a coin and correctly guessed 'heads' 5 times in a row. What are the odds that heads will come up on the next flip?
- 50% (1)
- more than 50% (0)
- or less than 50% (0)

GFTOTAL (composite variable created in SPSS dataset)

PERSONALITY

NEO-Five Factor Inventory (Form S) & NEO PI-R (Form S) Depression, Vulnerability, Impulsivity, Excitement-Seeking subscales (Costa & McCrae, 1992)

For each statement, select the response that best represents your opinion.

Fill in *Strongly disagree* if you strongly disagree or the statement is definitely false.
Fill in *Disagree* if you disagree or the statement is mostly false.
Fill in *Neutral* if you are neutral on the statement, if you cannot decide, or if the statement is about equally true and false.
Fill in *Agree* if you agree or the statement is mostly true.
Fill in *Strongly agree* if you strongly agree or the statement is definitely true.

NEO-N1 I am not a worrier.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-E1 I like to have a lot of people around me.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-O1 I don't like to waste my time daydreaming.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-A1 I try to be courteous to everyone I meet.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-C1 I keep my belongings neat and clean.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N2 I rarely feel fearful or anxious.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-E2 I usually prefer to do things alone.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-O2 Once I find the right way to do something, I stick to it.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-A2 I often get into arguments with my family and co-workers.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N-I3 I have little difficulty resisting temptation.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N-V8 I'm pretty stable emotionally.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N-I1 I rarely overindulge in anything.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-C2 I'm pretty good about pacing myself so as to get things done on time.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-I4 When I am having my favourite foods, I tend to eat too much.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N3 I often feel tense and jittery.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E3 I am not a cheerful optimist.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-O3 I am intrigued by the patterns I find in art and nature.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E-ES2 I often crave excitement.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-A3 Some people think I'm selfish and egotistical.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N-I5 I seldom give in to my impulses.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N-I6 I sometimes eat myself sick.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-C3 I am not a very methodical person.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N4 I often get angry at the way people treat me.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E4 I often feel as if I'm bursting with energy.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-O4 I believe letting students hear controversial speakers can only confuse and mislead them.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-A4 I would rather cooperate with others than compete with them.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-C4 I try to perform all the tasks assigned to me conscientiously.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N5 At times I have been so ashamed I just wanted to hide.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E5 I really enjoy talking to people.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-O5 Poetry has little or no effect on me.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-A5 I tend to be cynical and sceptical of others' intentions.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-C5 I have a clear set of goals and work toward them in an orderly fashion.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N6 I often feel inferior to others.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E6 I don't consider myself especially "light-hearted."
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-O6 I often try new and foreign foods.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-A6 I believe that most people will take advantage of you if you let them.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-C6 I waste a lot of time before settling down to work.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N7+NEO-N-D1 I rarely feel lonely or blue.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-E7 I would rather go my own way than be a leader of others.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-O7 I seldom notice the moods or feelings that different environments produce.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-A7 Most people I know like me.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-C7 When I make a commitment, I can always be counted on to follow through.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N8+NEO-N-D2 Sometimes I feel completely worthless.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E8 I am a cheerful, high-spirited person.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-O8 I believe we should look to our religious authorities for decisions on moral issues.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-A8 Some people think of me as cold and calculating.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-C8 Sometimes I'm not as dependable or reliable as I should be.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N9+NEO-N-D3 I am seldom sad or depressed.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-E9 My life is fast-paced.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-O9 Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of excitement.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-A9 I'm hard-headed and tough-minded in my attitudes.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-E-ES5 I tend to avoid movies that are shocking or scary.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-E-ES6 I love the excitement of roller coasters.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-D5 I have sometimes experienced a deep sense of guilt or sinfulness.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-C9 I am a productive person who always gets the job done.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N10+NEO-N-D4 Too often, when things go wrong, I get discouraged and feel like giving up.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E10 I am a very active person.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-O10 I have little interest in speculating on the nature of the universe or the human condition.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-A10 I generally try to be thoughtful and considerate.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E-ES8 I like being part of the crowd at sporting events.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-V4 I keep a cool head in emergencies.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-C10 I work hard to accomplish my goals.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-D6 I tend to blame myself when anything goes wrong.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-D7 I have a low opinion of myself.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-D8 Sometimes things look pretty bleak and hopeless to me.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N11+NEO-N-V1 I often feel helpless and want someone else to solve my problems.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E11 I laugh easily.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-V5 It's often hard for me to make up my mind.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-O11 I have a lot of intellectual curiosity.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-A11 If I don't like people, I let them know it.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-C11 I never seem to be able to get organised.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N12+NEO-N-V2 When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E12+NEO-E-ES1 I like to be where the action is.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-O12 I often enjoy playing with theories or abstract ideas.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-A12 If necessary, I am willing to manipulate people to get what I want.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-C12 I strive for excellence in everything I do.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-V3 I feel I am capable of coping with most of my problems.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-E-ES7 I'm attracted to bright colours and flashy styles.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-V6 I can handle myself pretty well in a crisis.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N-V7 When everything seems to be going wrong, I can still make good decisions.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N-I2 I have trouble resisting my cravings.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-I7 Sometimes I do things on impulse that I later regret.
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-E-ES3 I wouldn't enjoy vacationing in Las Vegas.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-N-I8 I am always able to keep my feelings under control.
- Strongly disagree (4)
- Disagree (3)
- Neutral (2)
- Agree (1)
- Strongly agree (0)

NEO-E-ES4 I have sometimes done things just for "kicks" or "thrills."
- Strongly disagree (0)
- Disagree (1)
- Neutral (2)
- Agree (3)
- Strongly agree (4)

NEO-N-TOTAL

NEONTSCORE (BOTH GENDERS: 1=26; 2=28; 3=29; 4=30; 5=32; 6=33; 7=34; 8=36; 9=37; 10=38; 11=39; 12=41; 13=42; 14=43; 15=45; 16=46; 17=47; 18=49; 19=50; 20=51; 21=53; 22=54; 23=55; 24=56; 25=58; 26=59; 27=60; 28=62; 29=63; 30=64; 31=66; 32=67; 33=68; 34=69; 35=71; 36=72; 37=73; ≥38=75)

NEO-N-D-TOTAL

NEO-N-D-TSCORE (FEMALES: 0=27, 1=29; 2=31; 3=32; 4=34; 5=36; 6=38; 7=39; 8=41; 9=43; 10=45; 11=47; 12=48; 13=50; 14=52; 15=54; 16=56; 17=57; 18=59; 19=61; 20=63; 21=64; 22=66; 23=67; 24=70; 25=72; 26=73; 27=75; 28=77; 29=79; 30-32=80) (MALES: 0=28; 1=30; 2=32; 3=33; 4=35; 5=37; 6=39; 7=42; 8=43; 9=45; 10=47; 11=49; 12=52; 13=53; 14=55; 15=57; 16=58; 17=60; 18=62; 19=64; 20=65; 21=68; 22=70; 23=72; 24=74; 25=76; 26=78; ≥27=80)

NEO-N-V-TOTAL

NEONVTSCORE (FEMALES: 0=23; 1=25; 2=28; 3=30; 4=33; 5=35; 6=38; 7=40; 8=43; 9=45; 10=48; 11=50; 12=53; 13=55; 14=58; 15=60; 16=63; 17=65; 18=68; 19=70; 20=73; 21=74; 22=78; 23-32=80) (MALES: 0=25; 1=28; 2=31; 3=33; 4=36; 5=39; 6=41; 7=44; 8=47; 9=49; 10=52; 11=55; 12=58; 13=60; 14=63; 15=66; 16=68; 17=71; 18=74; 19=76; 20=79; 21-32=80)

NEO-N-I-TOTAL

NEONITSCORE (FEMALES: 0-2=20; 3=21; 4=23; 5=25; 6=28; 7=30; 8=32; 9=34; 10=36; 11=38; 12=41; 13=43; 14=45; 15=47; 16=49; 17=53; 18=54; 19=56; 20=58; 21=60; 22=62; 23=65; 24=67; 25=69; 26=71; 27=73; 28=75; 29=78; 30-32=80) (MALES: 0-2=20; 3=21; 4=23; 5=25; 6=28; 7=30; 8=33; 9=35; 10=37; 11=41; 12=42; 13=45; 14=47; 15=50; 16=52; 17=54; 18=56; 19=59; 20=62; 21=65; 22=66; 23=68; 24=72; 25=73; 26=76; 27=78; ; ≥28=80)

NEO-E-TOTAL

NEOETSCORE (BOTH GENDERS: 12=<25; 13=25; 14=27; 15=28; 16=31; 17=32; 18=33; 19=35; 20=37; 21=39; 22=40; 23=42; 24=44; 25=45; 26=47; 27=49; 28=50; 29=52; 30=54; 31=56; 32=57; 33=59; 34=61; 35=62; 36=64; 37=66; 38=68; 39=69; 40=71; 41=73; 42=74; ≥43=75)

NEO-E-ES-TOTAL

NEO-E-ES-TSCORE (FEMALES: 0=20; 1=21; 2=24; 3=26; 4=27; 5=29; 6=31; 7=33; 8=35; 9=37; 10=39; 11=41; 12=43; 13=45; 14=47; 15=49; 16=51; 17=54; 18=55; 19=56; 20=59; 21=60; 22=62; 23=64; 24=66; 25=68; 26=70; 27=72; 28=74; 29=76; 30=78; 31-32=80) (MALES: 0-3=20; 4=22; 5=24; 6=26; 7=28; 8=30; 9=33; 10=35; 11=37; 12=39; 13=41; 14=44; 15=45; 16=47; 17=50; 18=53; 19=55; 20=56; 21=58; 22=60; 23=63; 24=64; 25=67; 26=70; 27=72; 28=74; 29=76; 30=78; 31=79; 32=80)

NEO-A-TOTAL

NEOATSCORE (BOTH GENDERS: <19=<25; 20=25; 21=26; 22=28; 23=30; 24=32; 25=34; 26=36; 27=38; 28=40; 29=42; 30=44; 31=46; 32=48; 33=50; 34=52; 35=54; 36=56; 37=58; 38=60; 39=62; 40=64; 41=66; 42=68; 43=70; 44=72; 45=74; 46=75; 47=>75)

NEO-C-TOTAL

NEO-C-TSCORE (BOTH GENDERS: <19=<25; 20=25; 21=27; 22=29; 23=30; 24=32; 25=34; 26=35; 27=37; 28=39; 29=41; 30=42; 31=44; 32=46; 33=47; 34=49; 35=51; 36=52; 37=54; 38=56; 39=58; 40=59; 41=61; 42=63; 43=64; 44=66; 45=68; 46=69; 47=71; 48=73; 49=>75)

NEO-O-TOTAL

NEO-O-TSCORE (BOTH GENDERS: 11=<25; 12=25; 13=26; 14=28; 15=29; 16=31; 17=33; 18=35; 19=36; 20=38; 21=40; 22=41; 23=43; 24=45; 25=47; 26=48; 27=50; 28=52; 29=53; 30=55; 31=57; 32=59; 33=60; 34=62; 35=64; 36=65; 37=67; 38=69; 39=70; 40=72; 41=74; 42=75; 43=>75)

STRESS

PAST YEAR STRESSORS (adaptation of the Life Events Questionnaire; Vuchinich, Tucker & Harllee, 1986)

S1. Check off any events that have happened to you in the past 12 months.

work/school
____started school (1)
____dropped out of school (2)
____experienced significant difficulties at school (3)

____was disciplined at school (4)
____started a new job (5)
____had a significant change in work hours (6)
____significant increase in work demands causing neglect to other areas of life (7)
____received an important promotion (8)
____had difficulty finding employment (9)
____was fired (10)
____was laid off (11)
____retired (12)
____had serious conflict(s) with coworker(s) (13)
____had serious conflict(s) with boss (14)
____was disciplined at work (15)
____suffered a significant business loss or failure (16)

family and friends
____moved to new location/house (17)
____became pregnant (or spouse became pregnant) (18)
____had a new addition to the family through birth or adoption (19)
____son or daughter left home (20)
____son or daughter married (21)
____started a relationship with a new boyfriend/girlfriend (22)
____got married (23)
____separated (24)
____divorced (25)
____broke up with boyfriend/girlfriend (26)
____had serious conflicts or difficulties with spouse or partner (27)
____had serious conflicts with family member(s) (28)
____had serious conflicts with close friend(s) (29)
____had serious conflicts with neighbor(s) (30)
____had serious conflicts with ex-spouse (31)
____death of spouse or partner (32)
____death of other close family member (33)
____death of close friend (34)
____experienced a miscarriage or abortion (35)
____serious illness or injury in family member or close friend (36)
____death of important family pet (37)

property and finances
____suffered a significant financial loss (38)
____declared bankruptcy (39)
____went on social support or welfare (40)
____suffered a significant loss or damage of property (41)
____borrowed a significant amount of money (e.g., mortgage) (42)
____had a significant financial improvement (43)

legal matters/crime
____arrested or charged with a crime (44)
____placed in jail (45)
____became involved in lawsuit (46)
____received serious threats or harassment (47)
____was assaulted (48)
____was robbed (49)
____was a victim of some other crime (50)

____caused a serious accident that injured or killed someone (51)
____witnessed a serious accident that injured or killed someone (52)

health
____became seriously overweight or underweight (53)
____developed a serious physical illness (54)
____developed a serious mental illness (55)
____developed a drug or alcohol addiction (56)
____suffered a serious injury as a result of an accident (57)

Other_____ (58)

STOTAL (composite variable created in SPSS dataset)
SNegTOTAL (total of the subset of negative stressors)

S2. In the past 12 months I would rate my overall level of stress as
- extremely high (7)
- very high (6)
- high (5)
- moderate (4)
- low (3)
- very low (2)
- extremely low (1)

S3. In the past 12 months I would rate my overall level of happiness as
- extremely high (7)
- very high (6)
- high (5)
- moderate (4)
- low (3)
- very low (2)
- extremely low (1)

S4. In the past 12 months I would rate my overall level of life satisfaction as
- extremely high (7)
- very high (6)
- high (5)
- moderate (4)
- low (3)
- very low (2)
- extremely low (1)

LIFETIME STRESSORS

SL1. Were you physically, sexually, or emotionally abused when you were growing up?
- no (0)
- yes (1)
- prefer not to say (8888)

SL2. Have you experienced any other traumatic event prior to the past 12 months that still affects you today?
- no (0) (go to next SECTION)
- yes (1)

SL3. What would that be?_____

MENTAL HEALTH

POST TRAUMATIC STRESS

MHPTS1. Have you been exposed to a traumatic event involving actual or threatened death or serious injury?
- yes (1)
- no (0) (go to next SECTION)

MHPTS2. Did your response involve intense fear, helplessness, horror, or agitation?
- yes (1)
- no (0) (go to next SECTION)

MHPTS3. In the past 12 months, have you had persistent distressing recollections of this event?
- yes (1)
- no (0)

MHPTS4. In the past 12 months, have you had persistent distressing dreams of this event?
- yes (1)
- no (0)

MHPTS5. In the past 12 months, have you have 'flashbacks' of the event where you seem to be reliving it?
- yes (1)
- no (0)

MHPTS6. In the past 12 months, have you had <u>intense</u> psychological or physical distress when exposed to reminders of the event?
- yes (1)
- no (0)

go to next SECTION if none of MHPTS3-6 are endorsed

MHPTS7. Do you try to avoid thoughts/feelings/conversations associated with the event?
- yes (1)
- no (0)

MHPTS8. Do you try to avoid activities/people/places associated with the event?
- yes (1)
- no (0)

MHPTS9. Do you have amnesia (no memory) for some part of the event?
- yes (1)
- no (0)

MHPTS10. Have you lost interest in a lot of things that you used to enjoy?
- yes (1)
- no (0)

MHPTS11. Do you have a feeling of detachment from others?
- yes (1)
- no (0)

MHPTS12. Do you have a limited range of emotional feelings?
- yes (1)
- no (0)

MHPTS13. Do you have a sense of a shortened future?
- yes (1)
- no (0)

go to next SECTION if there is no endorsement of at least 3 of MHPTS7-13

MHPTS14. Do you have difficulty falling or staying asleep?
- yes (1)
- no (0)

MHPTS15. Do you find yourself much more irritable?
- yes (1)
- no (0)

MHPTS16. Do you have more difficulty concentrating?
- yes (1)
- no (0)

MHPTS17. Do you have a heightened startle reflex or find yourself much more on edge?
- yes (1)
- no (0)

MHPTS (composite variable created programmatically; scored as 1 or 0). Scored as 1 if the following are endorsed: MHPTS1, MHPTS2, 1 of MHPTS3-6, 3 of MHPTS7-13, 2 of MHPTS14-17.

MHPTS (composite variable created in SPSS dataset; scored as 1, 0.5, or 0). Scored as 1 if the following are endorsed: MHPTS1, MHPTS2, 1 of MHPTS3-6, 3 of MHPTS7-13, 2 of MHPTS14-17. Scored as 0.5 if person said yes to a screening question but did not meet criteria for disorder.

ask the following questions of people scored as 1 or 2 on MHPA

MHPTS18a. Have you ever sought help for these problems?
- yes (1)
- no (0) (go to MHPTS19)

MHPTS18b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)

- counselling service (6)
- Pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHPTS18c. What was the nature of the help or treatment you received?

MHPTS19. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

MAJOR DEPRESSIVE EPISODE

MHD1. During the past 12 months, was there ever a time when you felt sad, blue, or depressed for two weeks or more in a row almost every day?
- yes (1) (go to MHD2b)
- no (0)

MHD2a. During the past 12 months, was there ever a time when you lost interest in most things like hobbies, work, or activities that usually give you pleasure for a period of two weeks or more in a row almost every day?
- yes (1) (go to MHD3)
- no (0) (go to next SECTION)

MHD2b. During that two week period, did you also lose interest in most things like hobbies, work, or activities that usually give you pleasure?
- yes (1)
- no (0)

MHD3. During that period did you gain or lose weight without trying (5% of body weight or 10 pounds)?
- yes (1)
- no (0)

MHD4a. During that period did you have more trouble falling asleep than you usually do?
- yes (1) (go to MHD5a)
- no (0)

MHD4b. During that period did you find yourself being excessively sleepy?
- yes (1)
- no (0)

MHD5a. During that period were you more agitated or restless than is usual for you?
- yes (1) (go to MHD6)
- no (0)

MHD5b. During that period were you more physically slow or inactive than is usual for you?
- yes (1)
- no (0)

MHD6. During that period did you experience a lot of fatigue or loss of energy?
- yes (1)
- no (0)

MHD7a.   During that period, did you feel down on yourself, no good, or worthless?
- yes (1) (go to MHD8)
- no (0)

MHD7b.   During that period, did you feel excessive or inappropriate guilt about things?
- yes (1)
- no (0)

MHD8. During that period did you have a lot more trouble concentrating or making decisions than usual?
- yes (1)
- no (0)

MHD9. During that period did you think a lot about death — either your own, someone else's, or death in general?
- yes (1)
- no (0)

MHD10. Did these problems significantly interfere with your life or activities at the time?
- yes (1)
- no (0)

MHD (composite variable; scored as 1 or 0). Scored as 1 if person has total score of 5 or more by adding together MHD1, MHD2a or MHD2b, MHD3, MHD4a or MHD4b, MHD5a or MHD5b, MHD6, MHD7a or MHD7b, MHD8, MHD9. Person must also score a 1 on either MHD1or MHD2a; person must also score a 1 on MHD10.

MHD (composite variable created in SPSS dataset; scored as 1, 0.5 or 0). Scored as 1 if person has total score of 5 or more by adding together MHD1, MHD2a or MHD2b, MHD3, MHD4a or MHD4b, MHD5a or MHD5b, MHD6, MHD7a or MHD7b, MHD8, MHD9. Person must also score a 1 on either MHD1or MHD2a; person must also score a 1 on MHD10.   Scored as 0.5 if person said yes to a screening question but did not meet criteria for disorder.

ask the following questions of people scored as 1 on MHD

MHD11. What do you believe was the main cause for these problems?

MHD12a. Have you ever sought help for these problems?
- yes (1)
- no (0) (go to MHD13)

MHD12b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)
- counselling service (6)
- Pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHD12c. What was the nature of the help or treatment you received?

MHD13. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

MANIC EPISODE

MHM1. In the past 12 months, have you had a period where your mood was <u>excessively</u> high for at least 1 week or resulted in hospitalization (i.e. a 'manic' episode)?
- yes (1)
- no (0) (go to next SECTION)

MHM2. Check off the symptoms that also occurred during this period.
____ inflated self-esteem (1)
____ decreased need for sleep (2)
____ much more talkative (3)
____ flight of ideas or racing thoughts (4)
____ greater distractibility (5)
____ increased activity level (6)
____ excessive involvement in pleasurable activities with high potential for painful consequences (sex, spending, etc.) (7)

MHM (composite variable created programmatically; scored as 1 or 0). Scored as 1 if answered yes to MHM1 and checked off 3 or more from MHM2.

MHM (composite variable created in SPSS dataset; scored as 1, 0.5, or 0). Scored as 1 if answered yes to MHM1 and checked off 3 or more from MHM2. Scored as 0.5 if person said yes to a screening question but did not meet criteria for disorder.

ask the following questions of people scored as 1 on MHM

MHM3. What do you believe was the main cause for these problems?

MHM4a. Have you ever sought help for these problems?
- yes (1)
- no (0) (go to MHM5)

MHM4b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)
- counselling service (6)
- Pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHM4c. What was the nature of the help or treatment you received?

MHM5. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

GENERALIZED ANXIETY

MHGA1a. During the past 12 months, have you experienced excessive anxiety or worry on most days for 6 or more months?
- yes (1)
- no (0) (go to next SECTION)

MHGA1b. Do you usually worry about one particular thing, such as your job security or the failing health of a loved one, or several different things?
- mostly one thing (0)
- several different things (1)

MHGA2. Do you find it difficult to stop worrying?
- yes (1)
- no (0) (go to next SECTION)

MHGA3. Check off the symptoms that also occur when you are worried or anxious
___restless or feeling keyed up or on edge (1)
___easily tired (2)
___difficulty concentrating (3)
___irritable (4)
___muscle tension (5)
___difficulty falling or staying asleep (6)

MHGA (composite variable created programmatically; scored as 0 or 1_. Scored as 1 if answer yes to MHGA1a, MHGA1b, MHGA2, and 3 symptoms from MHGA3.

MHGA (composite variable created in SPSS dataset; scored as 1, 0.5, or 0). Scored as 1 if answer yes to MHGA1a, MHGA1b, MHGA2, and 3 symptoms from MHGA3. Scored as 0.5 if person said yes to a screening question but did not meet criteria for disorder.

MHGA4. What do you believe is the main cause for these problems?

MHGA5a. Have you ever sought help for these problems?
- yes (1)
- no (0) (go to MHGA6)

MHGA5b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)
- counselling service (6)
- Pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHGA5c. What was the nature of the help or treatment you received?

MHGA6. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

PANIC ATTACKS & AGORAPHOBIA

MHPA1. In the past 12 months, have you had any 'panic attacks'. These are times when you suddenly feel intensely frightened, anxious, or very uneasy?
- yes (1)
- no (0) (go to next SECTION)

MHPA2. About how many attacks did you have in the past 12 months?
- just 1 (0) (go to next SECTION)
- 2-5 (1)
- 6 or more (2)

MHPA3a. Do these attacks just happen in situations where you are in danger or are the center of attention?
- yes (1) (go to next SECTION)
- no (0)

MHPA3b. Do these attacks often happen in situations where you believe escape might be difficult or where help may not be available if you have a panic attack? (e.g., being in a crowd, being away from home alone, traveling in a bus, train or car, being in a public place)
- yes (1)
- no (0) (go to MHPA5)

MHPA4. Do you therefore avoid these types of situations (e.g., being in a crowd, etc.), endure them with a great deal of distress, or try to ensure the presence of a companion?
- yes (1)
- no (0)

MHPA5. Check off the symptoms you have during panic attacks:
____racing or pounding heart (1)
____sweating (2)
____trembling or shaking (3)
____fear of dying (4)
____feelings of choking (5)
____chest pain (6)
____things around you seem unreal (7)
____nausea or stomach pain (8)
____dizzy or lightheaded (9)
____numbness or tingling (10)
____hot flashes or chills (11)
____fear of losing control or going crazy (12)

MHPA (composite variable created programmatically; scored 0, 1, or 2). Scored as 1 if scored 1 on MHPA1, 1 or 2 on MHPA2, 0 on MHPA3, 4 or more symptoms on MHPA5. Scored as 2 if meets all of the previous criteria + scores 1 on MHPA3b and MHPA4.

MHPA (composite variable created in SPSS dataset; scored 0, 0.5, 1, or 2). Scored as 1 if scored 1 on MHPA1, 1 or 2 on MHPA2, 0 on MHPA3, 4 or more symptoms on MHPA5. Scored as 2 if meets all of the previous criteria + scores 1 on MHPA3b and MHPA4. Scored as 0.5 if person said yes to a screening question but did not meet criteria for disorder.

MHPA6. What do you believe was the main cause for these problems?

MHPA7a. Have you ever sought help for these problems?
- yes (1)
- no (0) (go to MHPA9)

MHPA8b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)
- counselling service (6)
- Pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHPA8c. What was the nature of the help or treatment you received?

MHPA9. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

OBSESSIVE COMPULSIVE BEHAVIOUR

MHOC1. In the past 12 months have you been bothered by unpleasant thoughts of your own that kept entering your mind against your wishes. An example would be the persistent idea that your hands are dirty or have germs on them. Another example would be the persistent idea that you might harm someone, even though you really didn't want to?
- yes (1)
- no (0) (go to MHOC3)

MHOC2. Did these thoughts keep coming back again and again into your mind no matter how hard you tried to resist, ignore, or get rid of them?
- yes (1)
- no (0)

MHOC3. Some people have the unpleasant feeling they have to do something over and over again even though they know it is foolish, but they can't resist doing it – things like washing their hands again and again or going back several times to be sure they've locked a door or turned off the stove. In the past 12 months, have you had to do something like that over and over? (Other examples of this are having to do something in the exact right order, having to say certain words over and over, etc.).
- yes (1)
- no (0) (go to next SECTION)

MHOC4. Did these obsessive thoughts and/or compulsive behaviour seem excessive and unreasonable to you?
- yes (1)
- no (0) (go to next SECTION)

MHOC5. Did these obsessive thoughts and/or compulsive behaviour interfere with your life or work, or cause you difficulty with your relatives or friends, or upset you a great deal?
- yes (1)
- no (0)

MHOC (composite variable created programmatically; scored a 0 or 1). Scored as 1 if answered yes to MHOC4, MHOC5, and either MHOC1 & MHOC2 or MHOC3 or MHOC1, MHOC2, MHOC3.

MHOC (composite variable created in SPSS dataset; scored a 0, 0.5, or 1). Scored as 1 if answered yes to MHOC4, MHOC5, and either MHOC1 & MHOC2 or MHOC3 or MHOC1, MHOC2, MHOC3. Scored as 0.5 if person said yes to a screening question but did not meet criteria for disorder.

ask the following questions of people scored as 1 on MHOC

MHOC6. What do you believe was the main cause for these problems?

MHOC7a. Have you ever sought help for these problems?
- yes (1)
- no (0) (go to MHOC8)

MHOC7b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)
- counselling service (6)
- Pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHOC7c. What was the nature of the help or treatment you received?

MHOC8. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

BULIMIA

MHB1. In the past 12 months have you had several episodes of binge eating (at least twice a week for 3 months) where you ate an excessive amount of food and lacked control over how much you were eating?
- yes (1)
- no (0) (go to next SECTION)

MHB2. Have these episodes of binge eating been followed by behaviour to avoid weight gain such as self-induced vomiting, misuse of laxatives or other medications, excessive fasting, or excessive exercise?
- yes (1)
- no (0) (go to next SECTION)

MHB3. Is your self-image excessively influenced by your body shape and weight?
- yes (1)
- no (0) (go to next SECTION)

MHB (composite variable created programmatically; scored as 0 or 1). Scored as 1 if answers yes to MHB1, MHB2, MHB3.

MHB (composite variable created in SPSS dataset; scored as 0, 0.5, or 1). Scored as 1 if answers yes to MHB1, MHB2, MHB3. Scored as 0.5 if person said yes to a screening question but did not meet criteria for disorder.

ask the following questions of people scored as 1 on MHB

MHB4. What do you believe was the main cause for these problems?

MHB5a. Have you ever sought help for these problems?
- yes (1)
- no (0) (go to MHB6)

MHB5b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)
- counselling service (6)
- pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHB5c. What was the nature of the help or treatment you received?

MHB6. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

SCHIZOPHRENIA & DELUSIONAL DISORDER

MHS1. In the past 12 months have you suffered from hallucinations (not caused by drugs) or delusions?
- yes (1)
- no (go to next SECTION)

MHS2. Have you received a diagnosis of schizophrenia?
- yes (1)
- no (0) (go to next SECTION)
- unsure (9999)

MHS2_1. What do you believe caused these problems?

MHS3a. Have you ever sought help for these problems?
- yes (1)
- no (0)

MHS3b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)
- counselling service (6)
- Pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHS3c. What was the nature of the help or treatment you received?

MHS4. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

SUBSTANCE USE, ABUSE & DEPENDENCE (adaptation of WHO Alcohol, Smoking and Substance Involvement Screening Test (ASSIST 3.0) (WHO ASSIST Working Group, 2002) + Problem & Pathological Gambling Measure (Williams & Volberg, 2010, 2014)

MHSA1. Check off any substance you have used in the past 12 months (leave blank if none apply)
____tobacco products (cigarettes, chewing tobacco, cigars, etc.) (1)
____alcoholic beverages (beer, wine, spirits, etc.) (2)
____cannabis (marijuana, hashish, pot, etc.) (3)
____hallucinogens (LSD, mushrooms, PCP, Special K, mescaline, etc.) (4)
____cocaine or crack (5)
____amphetamine, methamphetamine or other stimulants (e.g., ecstasy) (6)
____inhalants (e.g., glue, gas/petrol, paint thinner, nail polish, etc.) (7)
____opiates (heroin, or nonmedical use of morphine, codeine, T3s, etc.) (8)
____nonmedical use of sedatives, sleeping pills, or minor tranquilizers (Valium, Serepax, Rohypnol, etc.) (9)
____other_____ (10)

MHSA2. How often have you used_____in the past 12 months?
- daily (9)
- several times a week (8)
- a few times a week (7)
- once a week (6)
- a few times a month (5) (go to next SECTION)
- once a month (4) (go to next SECTION)
- several times a year (3) (go to next SECTION)
- a few times a year (2) (go to next SECTION)
- once (1) (go to next SECTION)

MHSA3a. Has your use of any of these substances caused significant financial concerns for you or someone close to you in the past 12 months?
- yes (1)
- no (0)

MHSA3b. Has your use of any of these substances either caused you to borrow a significant amount of money or sell some of your possessions in the past 12 months?
- yes (1)
- no (0)

MHSA4. Has your use of any of these substances caused significant mental problems such as anxiety, depression, paranoia, or strange thoughts for you or someone close to you in the past 12 months?
- yes (1)
- no (0)

MHSA5a. Has your use of any of these substances caused serious problems in your relationship with your spouse/partner, or important friends or family in the past 12 months?
- yes (1)
- no (0)

MHSA5b. Has your use of any of these substances caused you to repeatedly neglect your children or family in the past 12 months?
- yes (1)
- no (0)

MHSA6a. Has your use of any of these substances caused you or someone else to have significant health problems or to be injured in the past 12 months?
- yes (1)
- no (0)

MHSA6b. In the past 12 months, have you repeatedly used any of these substances in ways or in situations that are dangerous (e.g., administering the drug by injection, driving while intoxicated, operating machinery while intoxicated, etc.)?
- yes (1)
- no (0)

MHSA7a. Has your use of any of these substances caused significant work or school problems for you or someone else in the past 12 months?
- yes (1)
- no (0)

MHSA7b. Has your use of any of these substances caused you to miss a significant amount of time off work or school in the past 12 months?
- yes (1)
- no (0)

MHSA8a. Has your use of any of these substances caused you or someone close to you to commit illegal acts to support your substance use in the past 12 months?
- yes (1)
- no (0)

MHSA8b. Has your use of any of these substances caused you or someone close to you to have legal problems in the past 12 months?
- yes (1)
- no (0)

MHSA9. Is there anyone else who would say that your use of any of these substances has caused any significant problems for you or someone close to you in the past 12 months, regardless of whether you thought it was true?
- yes (1)
- no (0)

MHSA10. In the past 12 months, have you used any of these substances in larger amounts, or for a longer time, or more frequently than you intended to?
- yes (1)
- no (0)

MHSA11. In the past 12 months, did you find that you had to use more and more of any of these substances to get the same effect you wanted?
- yes (1)
- no (0)

MHSA12. In the past 12 months, did you spend a great deal of time thinking about or doing things to obtain any of these substances?
- yes (1)
- no (0)

MHSA13. In the past 12 months, have you made unsuccessful attempts to cut down, control or stop using any of these substances?
- yes (1)
- no (0)

MHSA14. In the past 12 months, did you experience withdrawal symptoms when you stopped using the substance?
- yes (1)
- no (0)

Ask the following question if any of MHSA3a-MHSA14a were answered 'yes'.

MHSA15. In order of importance, which substance(s) have caused the above mentioned problems for you in the past 12 months?

_____

_____

_____

Substance (composite variable created programmatically; scored as 0, 1, 2)
- 0 if does not meet criteria for substance abuse or substance dependence
- 1 if meets criteria for substance abuse, which is saying yes for any of MHSA3a-MHSA9
- 2 if meets criteria for substance dependence, which is saying yes to any 3 of the following: MHSA10, MHSA11, MHSA12, MHSA13, MHSA14, MHSA3a-MHSA9 (maximum 2 from MHSA3a-MHSA9 counted toward total of 3).

MHSA (composite variable created in SPSS dataset; scored as 0, 0.5, 1, 2)
- 0 if does not use any substances
- 0.5 if a weekly substance user
- 1 if meets criteria for substance abuse, which is saying yes for any of MHSA3a-MHSA9
- 2 if meets criteria for substance dependence, which is saying yes to any 3 of the following: MHSA10, MHSA11, MHSA12, MHSA13, MHSA14, MHSA3a-MHSA9 (maximum 2 from MHSA3a-MHSA9 counted toward total of 3).

ask the following questions of people scored as 1 or 2 on MHSA

MHSA17. What do you believe was the main cause for these problems?

MHSA18a. Have you ever sought help for these problems?
- yes (1)
- no (0) (go to MHSA19)

MHSA18b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)
- counselling service (6)
- Pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHSA18c. What was the nature of the help or treatment you received?

MHSA19. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

HOUSEHOLD SUBSTANCE ABUSE

MHSU16. How many adults living in your household (not including yourself) would you say have had a substance abuse problem in the past 12 months?
- 0 (go to next SECTION)
- 1
- 2
- 3
- 4
- 5 or more (5)
- unsure (9999)

MHSU17. What is their relationship to you? (i.e., wife/husband, son/daughter, friend, etc.)?_____

BEHAVIOURAL ADDICTIONS (Behavioural Addiction Measure, which is an adaptation of the Problem & Pathological Gambling Measure; Williams & Volberg, 2010, 2014)

MHOA1. Are there other activities that you engage in where your over-involvement has caused significant problems for you in the past 12 months? Check off any that apply (leave blank if none apply)
____sex or pornography (1)
____exercise (2)
____shopping (3)
____Internet chat lines (4)
____Video or Internet gaming (5)
____other_____ (6)

go to next SECTION if nothing has been checked off

For every activity checked off, ask the following questions:

MHOA2. How often have you engaged in_____in the past 12 months?
- several times a day (7)
- daily (6)
- several times a week (5)
- a few times a week (4)
- once a week (3) (go to next SECTION)
- a few times a month (2) (go to next SECTION)
- once a month or less (1) (go to next SECTION)

MHOA3a. Has your involvement in this activity caused significant financial concerns for you or someone close to you in the past 12 months?
- yes (1)
- no (0)

MHOA3b. Has your involvement in this activity either caused you to borrow a significant amount of money or sell some of your possessions in the past 12 months?
- yes (1)
- no (0)

MHOA4. Has your involvement in this activity caused significant mental stress such as anxiety, depression, or paranoia for you or someone close to you in the past 12 months?
- yes (1)
- no (0)

MHOA5a. Has your involvement in this activity caused serious problems in your relationship with your spouse/partner, or important friends or family in the past 12 months?
- yes (1)
- no (0)

MHOA5b. Has your involvement in this activity caused you to repeatedly neglect your children or family in the past 12 months?
- yes (1)
- no (0)

MHOA6a. Has your involvement in this activity caused you or someone else to have significant health problems or to be injured in the past 12 months?
- yes (1)
- no (0)

MHOA6b. In the past 12 months, have you repeatedly engaged in this activity in situations or ways that are physically dangerous?
- yes (1)
- no (0)

MHOA7a. Has your involvement in this activity caused significant work or school problems for you or someone else in the past 12 months?
- yes (1)
- no (0)

MHOA7b. Has your involvement in this activity caused you to miss a significant amount of time off work or school in the past 12 months?
- yes (1)
- no (0)

MHOA8a. Has your involvement in this activity caused you or someone close to you to commit illegal acts in the past 12 months?
- yes (1)
- no (0)

MHOA8b. Has your involvement in this activity caused you or someone close to you to have legal problems in the past 12 months?
- yes (1)
- no (0)

MHOA9. Is there anyone else who would say that your involvement in this activity has caused any significant problems for you or someone close to you in the past 12 months, regardless of whether you thought it was true?
- yes (1)
- no (0)

MHOA10a. In the past 12 months, have you engaged in this activity for a longer time, or more frequently than you intended to?
- yes (1)
- no (0)

MHOA10b. In the past 12 months, have you made attempts to either cut down, control or stop your involvement in this activity?
- yes (1)
- no (0) (go to MHOA11b)

MHOA10c. Were you successful in these attempts?
- yes (1)
- no (0)

MHOA11a. In the past 12 months, did you experience irritability, restlessness, strong cravings or other withdrawal symptoms when you reduced or stopped engaging in this activity?
- yes (1)
- no (0)

MHOA11b. In the past 12 months, did you have strong cravings for the activity?
- yes (1)
- no (0)

MHOA12. In the past 12 months, is there anyone else who would say that you either had strong cravings for this activity or experienced a loss of control over your behaviour?
- yes (1)
- no (0)

MHOA13. In the past 12 months, did you spend a great deal of time thinking about or doing things related to this activity?
- yes (1)
- no (0)

MHOA14. In the past 12 months, did you find that you had to engage in this activity more and more to get the same effect you wanted?
- yes (1)
- no (0)

MHOA (composite variable created programmatically; scored as 0, 1, 2)
- 0 if does not meet criteria for other addictions
- 1 if meets criteria for problem eating, problem shopping, problem chat line use, problem sexual behaviour, problem video game use, or problem exercise (which is saying yes for any of MHOA3a-MHOA9)
- 2 if meets criteria for eating addiction, shopping addiction, chat line addiction, sexual addiction, video game addiction, or exercise addiction (which is saying yes to any of the MHOA3a-MHOA9 plus saying yes to any of MHOA10a, MHOA10b, MHOA11a, MHOA11b, or MHOA12).

MHOA (composite variable created in SPSS dataset; scored as 0, 0.5, 1, 2)
- 0 if does not meet criteria for other addictions
- 0.5 if person said yes to a screening question but did not meet criteria for disorder.
- 1 if meets criteria for problem eating, problem shopping, problem chat line use, problem sexual behaviour, problem video game use, or problem exercise (which is saying yes for any of MHOA3a-MHOA9)
- 2 if meets criteria for eating addiction, shopping addiction, chat line addiction, sexual addiction, video game addiction, or exercise addiction (which is saying yes to any of the MHOA3a-MHOA9 plus saying yes to any of MHOA10a, MHOA10b, MHOA11a, MHOA11b, or MHOA12).

ask the following questions of people scored as 1 or 2 on MHOA

MHOA15. What do you believe was the main cause for these problems?

MHOA16a. Have you ever sought help for these problems?
- yes (1)
- no (0) (go to MHOA17)

MHOA16b. Where did you seek help from?
- friends (1)
- family (2)
- family doctor (3)
- psychologist (4)
- psychiatrist (5)
- counselling service (6)
- pastor/minister/priest/etc. (7)
- telephone help/hotline (8)
- other_____ (9)

MHOA16c. What was the nature of the help or treatment you received?

MHOA17. Have you recovered from these problems?
- yes, fully recovered (1)
- partially recovered (2)
- no (3)

LIFETIME MENTAL HEALTH

MHL1a. **Prior to** the past 12 months, do you have any significant history of addiction to drugs or alcohol?
- yes (1)
- no (0) (go to MHL2a)

MHL1b. Which substances have you been addicted to?

MHL2a. **Prior to** the past 12 months, do you have any significant history of addiction to other things (i.e., exercise addiction, shopping addiction, sex addiction, Internet addiction)?
- yes (1)
- no (0) (go to MHL3a)

MHL2b. What other addictions have you had?

MHL3a. **Prior to** the past 12 months, do you have any significant history of mental health problems (e.g., depression, manic-depression, post-traumatic stress, schizophrenia, bulimia, anorexia, severe anxiety, obsessive-compulsive behaviour, etc.)?
- yes (1)
- no (0) (go to MHL4a)

MHL3b. What problems have you had?

MHL4a. Do either of your parents or brothers and sisters have any significant history of addictions?
- yes (1)
- no (0) (go to MHL5a)

MHL4b. Check off which ones and indicate the nature of the addiction(s)
____mother   _____
____father   _____
____brother (s) _____
____sister (s)   _____

MHL5a. Do either of your parents or brothers and sisters have any significant history of mental health problems?

- yes (1)
- no (0) (go to next SECTION)

MHL5b. Check off which ones and indicate the nature of the problem(s)

____mother   _____

____father   _____

____brother (s)   _____

____sister (s)   _____

SOCIAL FUNCTIONING

only ask SFM1 – SMF3 if person is married or living common-law (D13)

MARITAL FUNCTIONING (Kansas Marital Satisfaction Scale; Schumm et al., 1986)

SFM1. How satisfied are you with your (common law) marriage?

- Extremely dissatisfied (1)
- Very dissatisfied (2)
- Somewhat dissatisfied (3)
- Mixed (4)
- Somewhat satisfied (5)
- Very satisfied (6)
- Extremely satisfied (7)

SFM2. How satisfied are you with your husband/wife/partner as a spouse?

- Extremely dissatisfied (1)
- Very dissatisfied (2)
- Somewhat dissatisfied (3)
- Mixed (4)
- Somewhat satisfied (5)
- Very satisfied (6)
- Extremely satisfied (7)

SFM3. How satisfied are you with your relationship with your husband/wife/partner?

- Extremely dissatisfied (1)
- Very dissatisfied (2)
- Somewhat dissatisfied (3)
- Mixed (4)
- Somewhat satisfied (5)
- Very satisfied (6)
- Extremely satisfied (7)

SFMTOTAL (composite variable created in SPSS dataset)

SFM4. What is your sexual orientation?

- heterosexual (i.e., straight) (1)
- bisexual (2)
- homosexual (i.e., gay) (3)
- prefer not to say (8888)

SOCIAL SUPPORT (Nonsupport Scale from Personality Assessment Inventory; Morey & Boggs, 1991)

For each of the following questions, indicate whether the statement is 'false, not at all true', 'slightly true', 'mainly true', or 'very true'.

SFSS1. My friends are available if I need them
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very true (0)

SFSS2. I like being around my family
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very true (0)

SFSS3. If I'm having problems, I have people I can talk to.
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very true (0)

SFSS4.   I spend most of my time alone.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very true (3)

SFSS5. Most people I'm close to are very supportive.
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very true (0)

SFSS6. People I know care about me.
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very true (0)

SFSS7. In my family we argue more than we talk.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very true (3)

SFSS8. I spend little time with my family.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very true (3)

SFSSTOTAL (composite variable created in SPSS dataset)

FAMILY FUNCTIONING

SFF1. How would you rate your overall family functioning in the past 12 months?
- excellent (7)
- very good (6)
- good (5)
- average (4)
- below average (3)
- poor (2)
- very poor (1)
- unsure or not applicable (9999)

COMMUNITY QUALITY & INVOLVEMENT (first 2 questions from Buckner Neighbourhood Cohesion Scale; Buckner, 1988)

SFC1. There is a strong sense of community in my neighbourhood
- strongly agree (5)
- agree (4)
- neither agree nor disagree (3)
- disagree (2)
- strongly disagree (1)

SFC2. My neighbourhood is a good place to live
- strongly agree (5)
- agree (4)
- neither agree nor disagree (3)
- disagree (2)
- strongly disagree (1)

SFC3. The Quinte region is a good place to live
- strongly agree (5)
- agree (4)
- neither agree nor disagree (3)
- disagree (2)
- strongly disagree (1)

SFC4. I am actively involved in clubs, groups, and organizations within my community.
- strongly agree (5)
- agree (4)
- neither agree nor disagree (3)
- disagree (2)
- strongly disagree (1)

SFC5. I am actively involved in volunteer activities in my community.
- strongly agree (5)
- agree (4)
- neither agree nor disagree (3)
- disagree (2)
- strongly disagree (1)

SFC6. I am actively involved in the public life of my community (e.g., voting in elections, attending public meetings, etc.).
- strongly agree (5)
- agree (4)
- neither agree nor disagree (3)
- disagree (2)
- strongly disagree (1)

COMMUNITYTOTAL (composite variable created in SPSS dataset)
COMMUNITYQUALITY (score on 1st 3 questions)
COMMUNITYINVOLVEMENT (score on last 3 questions)

RELIGIOSITY (Rohrbaugh Jessor Religiosity Scale; Boivin, 1999; Nicholas & Durrheim, 1996)

SFR1. What is your religious affiliation?
- Catholic (1)
- Protestant (e.g., Anglican, Baptist, Lutheran, United, Presbyterian, etc.) (2)
- Muslim (3)
- Jewish (4)
- Buddhist (5)
- Hindu (6)
- Sikh (7)
- atheist (8) (go to SFR10)
- agnostic (9)
- other_____ (10)
- prefer not to say (8888)

SFR2. How many times have you attended religious services during the past year?
- Not at all (0)
- Once (1)
- 2-5 times (2)
- 6-10 times (3)
- Once or twice a month (4)
- Once a week (5)
- More than once a week (6)

SFR3. Which of the following best describes your practice of prayer or religious meditation?
- Prayer is a regular part of my daily life (3)
- I usually pray in times of stress or need but rarely at any other time (2)
- I pray only during formal ceremonies (1)
- I never pray (0)

SFR4. When you have a serious personal problem, how often do you take religious advice or teaching into consideration.
- Almost always (3)
- Usually (2)
- Sometimes (1)
- Never (0)

SFR5. How much influence would you say that religion has on the way that you choose to act and the way you choose to spend each day?
- No influence (0)
- A small influence (1)
- Some influence (2)
- A fair amount of influence (3)
- A large influence (4)

SFR6. Which of the following statements comes closest to your belief about God?
- I am sure that God really exists and that God is active in my life (4)
- Although I sometimes question his existence, I do believe in God and believe God knows of me as a person. (3)
- I don't know if there is a personal God, but I do believe in a higher power of some kind (2)
- I don't know if there is a personal God or a higher power of some kind, and I don't know if I ever will (1)
- I don't believe in a personal God or a higher power (0)

SFR7. Which one of the following statements comes closest to your belief about life after death (immortality)?
- I believe in a personal life after death, a soul existing as a specific individual spirit (4)
- I believe in a soul existing after death as a part of a universal spirit. (3)
- I believe in a life after death of some kind (2)
- I don't know whether there is any kind of life after death, and I don't know if I ever will know (1)
- I don't believe in any kind of life after death (0)

SFR8. During the past year, how often have you experienced a feeling of religious reverence or devotion?
- Almost Daily (4)
- Frequently (3)
- Sometimes (2)
- Rarely (1)
- Never (0)

SFR9. Do you agree with the following statement? "Religion gives me a great amount of comfort and security in life"
- Strongly Disagree (0)
- Disagree (1)
- Uncertain (2)
- Agree (3)
- Strongly Agree (4)

SFRTOTAL (composite variable created in SPSS dataset; sum of SFR3 – SFR9)

PARANORMAL BELIEFS

SFR10. Do you believe in reincarnation?
- yes (1)
- no (0)
- unsure (9999)

SFR11. Do you believe in ghosts?
- yes (1)
- no (0)
- unsure (9999)

SFR12. Do you believe in ESP (extra-sensory perception)
- yes (1)
- no (0)
- unsure (9999)

SFR13. Do you believe in astrology?
- yes (1)
- no (0)
- unsure (9999)

POLITICAL ORIENTATION

POL1. The political views of which party most closely resemble your own?
- Conservative Party (1)
- Liberal Party (2)
- New Democratic Party (3)
- Green Party (4)
- Other (5)
- unsure (9999)

RECREATIONAL ACTIVITIES

SFL1. Identify your 5 favorite leisure activities. Put a 1 beside the activity you enjoy the most; a 2 beside the activity you enjoy the second most; a 3 beside the activity you enjoy the third most; a 4 beside the activity you enjoy the fourth most; and a 5 beside the activity you enjoy the 5th most. Leave all the rest blank.
____cultural activities (theatre, concerts, museums) (1)
____gambling (2)
____gardening (3)
____going to movie theatres (4)
____going to restaurants or making meals (5)
____hobbies (6)
____hunting or fishing (7)
____listening or playing music (8)
____outdoor leisure (e.g., hiking, biking, boating, etc.) (9)
____playing computer/video games (10)
____playing card or board games (11)
____playing recreational sports or exercising (12)
____playing competitive sports (13)
____reading (14)
____shopping (15)

____socializing (16)
____surfing the Internet (17)
____traveling (18)
____watching TV (19)
____other_____ (20)
____other_____ (21)

OCCUPATIONAL FUNCTIONING

SFO1. In the past 12 months, how would you rate your overall level of job stress:
- extremely high (7)
- very high (6)
- high (5)
- moderate (4)
- low (3)
- very low (2)
- extremely low (1)
- not applicable (unemployed, student, retired, homemaker, etc.) (9999)

SFO2. In the past 12 months, how would you rate your overall level of job satisfaction:
- extremely high (7)
- very high (6)
- high (5)
- moderate (4)
- low (3)
- very low (2)
- extremely low (1)
- not applicable (unemployed, student, retired, homemaker, etc.) (9999)

ILLEGAL BEHAVIOUR (PLUS ANTISOCIAL PERSONALITY)

Antisocial Features subscale (24 questions) from Personality Assessment Inventory (Morey & Boggs, 1991)

SFI1. In your lifetime, have you done any of the following: (check off all that apply)
____assault (1)
____sexual assault (2)
____robbery/mugging (3)
____break & enter (4)
____theft (5)
____shoplifting (6)
____fraud or embezzlement (7)
____drug trafficking (8)
____arson (9)
____causing a disturbance (10)
____vandalism (11)
____impaired driving (12)
____dangerous operation of a vehicle (13)
____other_____ (14)

SFI2a. Have you ever been charged with a criminal offence?
- yes (1)
- no (0) (go to SF15)

SFI2b. How many charges have you had?
- just one (1)
- 1-3 (2)
- 3-5 (3)
- more than 5 (4)

SFI2c. Which offences have you been charged with?_____

SFI3a. Have you ever been convicted of a criminal offence?
- yes (1)
- no (0) (go to SFI5)

SFI3b. How many convictions do you have?
- just one (1)
- 1-3 (2)
- 3-5 (3)
- more than 5 (4)

SFI4. Have you ever been incarcerated (i.e., jail, remand centre, prison)?
- yes (1)
- no (0)

For each of the following questions, answer 'false, not at all true', 'slightly true', 'mainly true' or 'very true'.

SFI5.   I was usually well-behaved at school.
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very True (0)

SFI6. I've deliberately damaged someone's property.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI7. I've done some things that weren't exactly legal.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI8. I used to lie a lot to get out of tight situations.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI9. I like to see how much I can get away with.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI10. I was never expelled or suspended from school when I was young.
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very True (0)

SFI11. I've never been in trouble with the law.
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very True (0)

SFI12. I've never taken money or property that wasn't mine.
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very True (0)

SFI13. I've borrowed money knowing I wouldn't pay it back.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI14. I'll take advantage of others if they leave themselves open to it.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI15. I'll do most things if the price is right.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI16. I can talk my way out of just about anything.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI17. I don't like being tied to one person.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI18. I don't like to stay in a relationship very long.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI19. I look after myself first; let others take care of themselves.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI20. When I make a promise, I really don't need to keep it.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI21. I get a kick out of doing dangerous things.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI22. I do a lot of wild things just for the thrill of it.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI23. My behavior is pretty wild at times.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI24. If I get tired of a place, I just pick up and leave.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI25. The idea of 'settling down' has never appealed to me.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI26. I like to drive fast.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI27. I'm not a person who turns down a dare.
- False, not at all true (0)
- Slightly true (1)
- Mainly true (2)
- Very True (3)

SFI28. I never take risks if I can avoid it.
- False, not at all true (3)
- Slightly true (2)
- Mainly true (1)
- Very True (0)

PAIANTTOTAL (composite variable created in SPSS dataset; SFI5-SFI28)

PAIANTTSCORE (composite variable created in SPSS dataset) (0=36; 1=37; 2=38; 3=39; 4=40; 5=41; 6=42; 7=43; 8=44; 9=45; 10=47; 11=48; 12=49; 13=50; 14=51; 15=52; 16=53; 17=54; 18=55; 19=56; 20=58; 21=59; 22=60; 23=61; 24=62; 25=63; 26=64; 27=65; 28=66; 29=67; 30=68; 31=70; 32=71; 33=72; 34=73; 35=74; 36=75; 37=76; 38=77; 39=78; 40=79; 41=80; 42=81; 43=82; 44=83; 45=85; 46=86; 47=87; 48=88; 49=89; 50=90; 51=91; 52=92; 53=93; 54=94; 55=95; 56=96; 57=97; 58=98; 59=100; 60=101; 61=102; 63=103; 64=104; 65=106; 66=107; 68=109)

SFI29. In the **past 12 months**, have you done any of the following? (check off all that apply)
____assault (1)
____sexual assault (2)
____robbery/mugging (3)
____break & enter (4)
____theft (5)
____shoplifting (6)
____fraud or embezzlement (7)
____drug trafficking (8)
____arson (9)
____causing a disturbance (10)
____vandalism (11)
____impaired driving (12)
____dangerous operation of a vehicle (13)
____other_____ (14)

END

This is the end of the questionnaire. Thank you for your time and your important contribution to this research! We will contact you again in approximately 9 months when it is time for the next assessment. If you have any questions or would like more information regarding this or your next assessment please feel free to contact us at your convenience at info@qeri.ca, by phone (866-969-8313), or by dropping into our office at 37 Pinnacle Street South in Belleville.

Between now and then we would like you to do 2 things:

Let us know about any change in your contact information
Please contact us if there is any change in your address, phone number or e-mail in the next 9 months.

Record any significant life events or significant change in your gambling behaviour in a journal
The purpose of this journal is to a) to provide us with a better 'real time' understanding of changes in your behaviour between assessments, and b) reduce your reliance on memory at the next assessment 9 months from now. There are 2 things we would like you to record.

1. The first is **any *significant* life event**. This would include things such as starting a new job; pregnancy; divorce; bankruptcy; victim of crime; etc.

2. The second is **any *significant change* in your gambling behaviour**. These include the following:
   - engaging in a new type of gambling for the first time
   - a significant increase or decrease in frequency or spending on a certain type of gambling
   - a large gambling win or large loss
   - the development or worsening of gambling problems
   - receiving treatment for problem gambling

If either of these things occur, we would like you to indicate a) the date and b) the event. You can record this information in a paper journal we will provide you with or by logging in at our website at www.qeri.ca and recording it online (under Longitudinal Participant).

These journals are not mandatory. You can still continue participating in the 9 month assessments even if you don't fill them out. However, it will really help our research if you do fill them out.

People doing this assessment from their home should print out this page for their records.

Next >

LOCATION. Did you do this questionnaire at the QERI office or some other location?
□ Some other location (go to PAYMENT1)
□ At the QERI Office at 37 Pinnacle Street South in Belleville (go to PAYMENT2)

PAYMENT1. Your cheque (from Robert Hann & Associates) will be sent to you in the mail within a few days. Thank you, and see you in 9 months!

Finished

PAYMENT2. Notify one of the Research Assistants that you are finished and you will receive your cheque and your paper journal. Thank you, and see you in 9 months!

Appendix C: Problem and Pathological Gambling Measure

(Williams & Volberg, 2010; 2014)

1a. Has <u>your</u> involvement in gambling caused you either to borrow a significant [43] amount of money or sell some of your possessions in the past 12 months? (Yes/No).

1b. Has <u>your</u> involvement in gambling caused significant **financial concerns** for you or someone close to you in the past 12 months? (Yes/No). (Note: do not score 1 for 1b if 1 has already been scored for 1a).

2. Has <u>your</u> involvement in gambling caused significant **mental stress** in the form of guilt, anxiety, or depression for you or someone close to you in the past 12 months? (Yes/No).

3a. Has <u>your</u> involvement in gambling caused serious problems [44] in your **relationship with your spouse/partner, or important friends or family** in the past 12 months? (Note: Family is whomever the person themselves defines as "family") (Yes/No).

3b. Has <u>your</u> involvement in gambling caused you to repeatedly neglect your children or family in the past 12 months? (Yes/No). (Note: do not score 1 for 3b if 1 has already been scored for 3a).

4. Has <u>your</u> involvement in gambling resulted in significant **health problems** or injury for you or someone close to you in the past 12 months? (Yes/No).

5a. Has <u>your</u> involvement in gambling caused significant **work or school problems** for you or someone close to you in the past 12 months? (Yes/No).

5b. Has <u>your</u> involvement in gambling caused you to miss a significant amount of time off work or school in the past 12 months? (Yes/No). (Note: do not score 1 for 5b if 1 has already been scored for 5a).

6. Has <u>your</u> involvement in gambling caused you or someone close to you to write bad cheques, take money that didn't belong to you or commit other **illegal acts** to support your gambling in the past 12 months? (Yes/No).

7. Is there anyone else who would say that <u>your</u> involvement in gambling in the past 12 months has caused any significant problems regardless of whether you agree with them or not? (Yes/No).

PROBLEMS SCORE	**/7**

---

[43] If people ask what 'significant' means, say 'significant means something that either you or someone else would say is considerable, important, or major', either because of its frequency or seriousness.

[44] If people ask what 'problem' means say 'a difficulty that needs to be fixed'.

8. In the past 12 months, have you often gambled longer, with more money or more frequently than you intended to? (Yes/No).

9. In the past 12 months, have you often gone back to try and win back the money you lost? (Yes/No).

10a. In the past 12 months, have you made any attempts to either cut down, control or stop your gambling? (Yes/No). (go to 11 if 'no') (this item not scored)

10b. Were you successful in these attempts? (Yes/No). (score '1' for no and '0' for yes)

11. In the past 12 months, is there anyone else who would say that you have had difficulty controlling your gambling, regardless of whether you agreed with them or not? (Yes/No).

IMPAIRED CONTROL SCORE	**/4**

12. In the past 12 months, would you say you have been preoccupied with gambling? (Yes/No).

13. In the past 12 months, when you were not gambling did you often experience irritability, restlessness or strong cravings for it? (Yes/No).

14. In the past 12 months, did you find you needed to gamble with larger and larger amounts of money to achieve the same level of excitement? (Yes/No).

15. (Optional question; not included in scoring):   In the past 12 months, have you often lied to people about your gambling or often concealed the extent of your gambling from other people? (Yes/No).

16. (Optional question; not included in scoring): In the past 12 months, have you often gambled to escape bad moods or other troubles? (Yes/No).

17. (Optional question; not included in scoring): Do you believe you had have a problem with gambling in the past 12 months? (Yes/No).

OTHER ISSUES SCORE	**/3**

TOTAL SCORE	**/14**

PPGM SCORING & CLASSIFICATIONS

PATHOLOGICAL GAMBLER (4)
- Problems Score of 1 or higher, plus
- Impaired Control Score of 1 or higher, plus
- Total Score of 5 or higher, plus
- Reported gambling frequency of at least once a month on some form of gambling.

PROBLEM GAMBLER (3)
- Problems Score of 1 or higher, plus
- Impaired Control Score of 1 or higher, plus
- Total Score of 2 to 4, plus
- Reported gambling frequency of at least once a month on some form of gambling.

OR
- Total Score of 3 or higher, plus
- Frequency of gambling[45] AND average reported gambling loss[46] $\geq$ median for unambiguously identified Problem and Pathological Gamblers in the population (i.e., as established by the most recent population prevalence survey).

AT RISK GAMBLER (2) (this category also includes people who may be problem gamblers in denial)
- Does not meet criteria for Problem or Pathological gambling, plus
- Total Score of 1 or higher
- Reported gambling frequency of at least once a month on some form of gambling.

OR
- Frequency of gambling[3] AND average reported gambling loss[4] $\geq$ median for unambiguously identified Problem and Pathological Gamblers in the population (i.e., as established by the most recent population prevalence survey).

RECREATIONAL GAMBLER (1)
Gambler who does not meet criteria for Pathological, Problem or At Risk gambler.

NONGAMBLER (0)
No reported gambling on any form in past year.

---

[45] The easiest way of establishing this is by using the highest frequency of gambling reported for any individual form in the past year.

[46] Sometimes gambling expenditure is collected by asking about both losses on gambling and winning on gambling. In this situation it is best to use the reported losses figure rather than *net* losses figure, as it tends to be a more accurate estimate of true losses, especially among problem gamblers. Note also that the scorer may choose not to apply the gambling loss criteria so as to designate someone as an 'At Risk Gambler' or 'Problem Gambler' in situations where the person's income and/or net worth is very high relative to the general population.

<u>Reliability</u>

Cronbach's alpha = .76 to .81 (depending on the dataset)
One month test-retest reliability of .78 (Total Score) and .68 (5 categories)

<u>Validity</u>

Pearson Correlation with SOGS (Categories) = .69; NODS (Categories) = .78; CPGI (Categories) = .70
Pearson Correlation with Gambling frequency = .41
Pearson Correlation with Gambling Net Expenditure = .20
Classification Accuracy (against clinical assessment): 99.7% sensitivity; 98.9% specificity; 93.5% positive predictive power; 99.9% negative predictive power; 99.0% diagnostic efficiency; 0.96 kappa

<u>References</u>

Williams RJ & Volberg RA (2010). *Best Practices in the Population Assessment of Problem Gambling.* Report submitted to the Ontario Problem Gambling Research Centre. Guelph, Ontario. March 31, 2010. http://hdl.handle.net/10133/1259.

Williams RJ & Volberg RA (2014). Classification Accuracy of Four Problem Gambling Assessment Instruments. *International Gambling Studies, 14 (1),* 15-28.

Appendix D: Similarities and Differences between the QLS and LLLP

	Quinte Longitudinal Study	Leisure, Lifestyle, Lifecycle Project
Funder	Ontario Problem Gambling Research Centre	Alberta Gambling Research Institute
Funding	$3.1 million	$2.3 million
Research Team	*Principal Investigators*: R Williams, R Hann *Co-Investigator*: D Schopflocher *Research Associate*: B West *Office Team Manager*: P McLaughlin *QLS Office Team*: N White, K King *U of L Technical Support*: T Flexhaug	*Principal Investigators*: N el-Guebaly, D Casey, S Currie, D Hodgins, D Schopflocher, G Smith, R Williams *Project Coordinator*: D Casey
Time Period	March 2006 – April 2011	February 2006 – November 2011
Geographic Region	70 km range around Belleville, Ontario	Cities of Calgary (41.7%) and Edmonton (29.6%) and cities and surrounding areas of Grande Prairie (12.4%) and Lethbridge (16.3%) in Alberta[47]
Baseline Sample Size	4,121	1,372 adults + 436 adolescents = 1,808
High Risk Oversample Size and Criteria	1,052 (25.5% of the 4,121) • spending $10+ in typical month on lottery and instant win tickets; bingo; casino table games; or games of skill against other people OR • playing slot machines or betting on horse racing in past year OR • intention to gamble at the new QER-II	524 (29.0% of the 1,808) $\geq 70^{th}$ percentile on past month spending or frequency of gambling
Recruitment Approach	Random digit dialing	Random digit dialing + supplemental (*n* = 33) media & snowball recruitment for the At Risk sample
Recruitment Response Rate[48]	21.3%	5.4% [49]
Initial Age Range/Groupings	17 – 89 Average = 46.5	13-15; 18-20; 23-25; 43-45; 63-65 Average (excluding 13-15) = 37.9
Number of Assessments	5	4
Inter-Assessment Interval [50]	12 months	17-22 months
Assessment Time Period	November – March	Variable
Assessment Window [51]	5 months	9-10 months

[47] Sampling designed to approximate the demography of Alberta (65% of whom live in Edmonton and Calgary).
[48] As calculated by the Council of American Survey Research Organizations criteria (CASRO, 1982).
[49] The low response rate in LLLP is partly due to the fact that Assessment 1 had to be completed in person.
[50] Time from start of one assessment to start of next assessment.

	Quinte Longitudinal Study	Leisure, Lifestyle, Lifecycle Project
Questionnaire Administration Format	Computerized and self-administered (98.2% - 99.2%) or paper & pencil self-administered (0.8% - 1.8%). Completed at either the QLS office (10.1% - 29.6%) or on person's home computer (70.4% - 89.9%).	Assessment 1: telephone interview of gambling + face-to-face interview of Life Events Questionnaire, Wechsler Abbreviated Scale of Intelligence and Wisconsin Card Sorting Test with remainder of questionnaire computerized and self-administered in LLLP office. Assessments 2 – 4: computerized and self-administered on home computer (88.4% - 90.4%) or paper & pencil self-administered at home (9.6% - 11.6%).
Independent Variables	Comprehensive (~135) and very similar to LLLP	Comprehensive and very similar to QLS
Gambling Behaviour	Expenditure and frequency on 10 types of gambling (raffles and casinos outside province not assessed)	Expenditure, frequency, and time on 11 types of gambling
Problem Gambling Measures	• PPGM (primary) • CPGI 5+ • DSM-IV (NODS)	• CPGI 5+ (primary) • DSM–IV lifetime (CIDI) • DSM-IV-MR-J (adolescents)
Assessment Length	Median time of 35 – 84 minutes depending on the assessment	Average of 3 hours for Assessment 1
Participant Compensation	$50 for Assessment 1 $30 for Assessment 2 $30 for Assessment 3 $35 for Assessment 4 $35 for Assessment 5	$75 for Assessment 1 $45 for Assessment 2 $45 for Assessment 3 $75 for Assessment 4
Retention	• 93.9% of eligible participants completed Assessment 5 • 88.7% of eligible participants completed all 5 assessments	• 76.2% of eligible adult participants completed Assessment 4 • 68.4% of eligible adults completed all 4 assessments • 71.8% of eligible adolescents completed Assessment 4 • 59.6% of eligible adolescents completed all 4 assessments
Characteristics of People not Completing Final Assessment	Not married, poorer physical health, male	Younger age, less education, male, problem gambler (CPGI 5+), resident of Grande Prairie or Lethbridge
Total # of Problem Gamblers	277 (236 completing 5/5 assessments)	94 (57 completing 4/4 assessments)
# of First Onset Problem Gamblers Beyond the 1st Assessment	134	43

---

[51] Length of time the person was eligible to complete the assessment.

Appendix E: Problem Gambling Stability for Participants with Missing Assessments

Stability of PPGM Problem/Pathological Gambling in the QLS over Time for Participants with Missing Assessments (n = 42).

Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5
Missing 1 Assessment				
red	999999	red		red
red	999999	red		
red			999999	
red		red		999999
red	999999			999999
red				999999
red			red	
red			999999	
	999999	red	red	red
	999999			999999
	red	999999	red	999999
	red		999999	
	red		red	
	red	999999		
	999999			
		red		999999
		999999		red
			red	999999
Missing 2 Assessments				
red	999999		999999	red
			999999	999999
red			999999	999999
red			999999	999999
	red		999999	999999
		999999	999999	red
Missing 3 Assessments				
red	red	999999	999999	999999
red		999999	999999	999999
red		999999	999999	999999
red		999999	999999	999999
red	999999		999999	999999
	red	999999	999999	999999
	red	999999	999999	999999
Missing 4 Assessments				
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999

Each row represents an individual, with red designating problem gambling, white designating non-problem gambling, and 999999 designating a missing assessment.

Stability of CPGI 5+ Problem Gambling in the QLS over Time for Participants with Missing Assessments (*n* = 44).

Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5
Missing 1 Assessment				
red	red	red	red	999999
red	999999	red	red	red
red	999999	red	red	red
red	red	999999	red	red
red	red	red	red	999999
red	999999	red		red
red	999999	red		
red	red			999999
red	999999			
red	999999			
red				999999
red				999999
red				999999
	red	999999	red	
	red		red	999999
	999999		red	
		red	999999	
		red		999999
			999999	red
Missing 2 Assessments				
red	red	red	999999	999999
red	999999	red	999999	red
red	red	999999	999999	red
red			999999	999999
red			999999	999999
red			999999	999999
	red	red	999999	999999
	red	red	999999	999999
Missing 3 Assessments				
red	red	999999	999999	999999
red	red	999999	999999	999999
red	999999	999999	999999	
red	999999		999999	999999
red		999999	999999	999999
	red	999999	999999	999999
		999999	999999	999999
Missing 4 Assessments				
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999
red	999999	999999	999999	999999

Each row represents an individual, with red designating problem gambling, white designating non-problem gambling, and 999999 designating a missing assessment.

Stability of CPGI 5+ Problem Gambling in the LLLP over Time for Participants with Missing Assessments
(n = 37).

Assessment 1	Assessment 2	Assessment 3	Assessment 4
Missing 1 Assessment			
red	red	red	999999
red	red	red	999999
red	999999	red	red
red	white	999999	red
white	red	999999	red
white	999999	white	red
white	999999	white	red
white	white	red	999999
white	white	red	999999
white	white	red	999999
white	white	999999	red
Missing 2 Assessments			
red	red	999999	999999
red	red	999999	999999
red	red	999999	999999
red	999999	999999	red
white	red	999999	999999
white	red	999999	999999
white	red	999999	999999
Missing 3 Assessments			
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999
red	999999	999999	999999

Each row represents an individual, with red designating problem gambling, white designating non-problem gambling, and 999999 designating a missing assessment.

Stability of PPGM Pathological Gambling in the QLS over Time for Participants with Missing Assessments (*n* = 14).

Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5
Missing 1 Assessment				
			999999	
	999999			
	999999			999999
	999999			
	999999			999999
		999999		
Missing 2 Assessments				
	999999		999999	
		999999	999999	
Missing 3 Assessments				
		999999	999999	999999
Missing 4 Assessments				
	999999	999999	999999	999999
	999999	999999	999999	999999
	999999	999999	999999	999999
	999999	999999	999999	999999

Stability of CPGI 8+ Severe Problem Gambling in the QLS over Time for Participants with Missing Assessments (*n* = 21).

Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5
Missing 1 Assessment				
		999999		
	999999			
	999999			
	999999			
				999999
	999999			
				999999
				999999
		999999		
				999999
Missing 2 Assessments				
			999999	999999
	999999		999999	
			999999	999999
Missing 3 Assessments				
		999999	999999	999999
	999999		999999	999999
Missing 4 Assessments				
	999999	999999	999999	999999
	999999	999999	999999	999999
	999999	999999	999999	999999
	999999	999999	999999	999999
	999999	999999	999999	999999

Each row represents an individual, with dark red designating pathological gambling, red designating problem gambling, white designating non-problem gambling, and 999999 designating a missing assessment.

Stability of CPGI 8+ Severe Problem Gambling in the LLLP over Time for Participants with Missing Assessments (*n* = 13).

Assessment 1	Assessment 2	Assessment 3	Assessment 4
Missing 1 Assessment			
[dark red]	[dark red]	[dark red]	999999
[red]	999999	[dark red]	[dark red]
[dark red]	[white]	999999	[white]
Missing 2 Assessments			
[red]	[dark red]	999999	999999
[dark red]	999999	999999	[dark red]
[white]	[dark red]	999999	999999
[white]	[dark red]	999999	999999
Missing 3 Assessments			
[dark red]	999999	999999	999999
[dark red]	999999	999999	999999
[dark red]	999999	999999	999999
[dark red]	999999	999999	999999
[dark red]	999999	999999	999999
[dark red]	999999	999999	999999

Each row represents an individual, with dark red designating pathological gambling, red designating problem gambling, white designating non-problem gambling, and 999999 designating a missing assessment.

Appendix F: Independent Variable Correlates of Non-Gamblers (NGs), Non-Problem Gamblers (NPGs), and PPGM Problem Gamblers (PG) in QLS

		AVERAGE [52]			Assessment 1			Assessment 2			Assessment 3			Assessment 4			Assessment 5		
p < .05 (2 tail) *p < .01 (2 tail)*		NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
		n=360	*n=3451*	*n=107*	*n=309*	*n=3675*	*n=136*	*n=298*	*n=3528*	*n=113*	*n=363*	*n=3435*	*n=103*	*n=423*	*n=3302*	*n=104*	*n=406*	*n=3316*	*n=77*
DEMOGRAPHICS																			
Male %		44.9	44.8	44.7	43.7	45.4	47.8	42.6	45.3	39.8	45.5	44.7	39.8	45.9	44.5	46.2	45.8	44.2	50.6
Age *M (SD)* (Baseline range[53]: 17.3-89.5)		50.1 (15.4)	48.4 (13.8)	48.5 (13.8)	48.2 (15.6)	46.4 (14.0)	46.7 (15.0)	50.2 (15.2)	47.5 (13.9)	47.0 (12.6)	50.0 (15.4)	48.4 (13.8)	49.4 (13.7)	50.1 (15.3)	49.6 (13.7)	49.3 (13.9)	51.4 (15.6)	50.4 (13.6)	51.3 (13.3)
Immigrant %		11.8	7.3	9.3	12.6	7.3	10.3	10.1	7.5	11.5	11.6	7.3	10.7	11.6	7.1	8.9	12.8	7.3.	7.8
Ethnicity	Aboriginal %	3.4	4.5	4.5	3.2	4.5	5.1	2.3	4.6	0.0	3.6	4.4	5.8	4.3	4.4	7.7	3.0	4.6	3.9
	African %	0.2	0.3	0.4	0.0	0.3	0.7	0.0	0.3	0.0	0.8	0.3	1.0	0.0	0.3	0.0	0.2	0.2	0.0
	Asian %	0.7	0.6	1.1	0.9	0.6	0.7	1.0	0.7	0.0	0.0	0.6	1.0	0.7	0.5	0.0	1.0	0.5	5.2
	European %	90.9	87.0	79.4	92.6	87.0	77.2	91.3	87.0	79.6	91.2	86.9	77.7	90.1	87.1	80.8	89.7	86.9	83.1
	Other %	4.9	7.6	14.3	3.2	7.6	16.2	5.4	7.4	15.9	4.4	7.8	14.6	5.0	7.7	11.5	6.2	7.7	11.7
Non-Caucasian %		9.2	13.1	20.6	7.4	13.0	22.8	8.7	13.0	20.4	8.9	13.1	22.3	9.9	12.9	19.2	10.3	13.1	16.9
Adopted %		2.6	3.4	3.6	3.2	3.3	5.2	3.0	3.4	2.7	1.9	3.5	3.9	2.6	3.5	1.9	2.5	3.3	3.9
Raised by Biological Parents %		84.3	82.0	77.3	84.8	82.0	71.3	85.9	81.8	82.3	85.7	82.0	73.8	84.6	82.0	76.9	81.3	82.1	85.7
	≤ Elementary school %	1.2	1.1	1.7	1.3	1.1	2.2	1.71	1.0	1.8	1.4	1.0	1.0	0.9	1.1	1.9	0.7	1.1	1.3
	≤ Technical college %	44.4	57.3	68.5	41.1	57.7	68.4	45.0	56.8	69.9	43.8	57.3	66.0	44.0	57.8	65.4	47.5	57.0	74.0
	Completed college/university %	54.4	41.6	29.8	57.6	41.1	29.4	53.4	42.1	28.3	54.8	41.7	33.0	55.1	41.2	32.7	51.7	41.9	24.7
Marital Status	Never married %	11.4	10.1	14.8	13.3	11.6	18.4	9.1	10.5	14.2	11.0	9.7	16.5	11.8	9.2	12.5	11.6	9.1	10.4
	Married %	64.0	59.7	44.5	61.5	58.4	40.4	64.1	59.6	48.7	64.7	60.3	39.8	64.5	60.4	49.0	64.5	60.0	45.5
	Living common-law %	6.8	12.7	14.8	7.1	13.7	19.9	7.0	13.0	12.4	6.9	12.6	10.7	6.6	11.9	14.4	6.4	12.1	15.6
	Separated %	5.4	5.4	12.2	5.2	4.9	8.1	7.4	5.4	13.3	4.7	5.5	16.5	5.9	5.5	11.5	4.2	6.0	13.0
	Divorced %	8.2	7.9	10.3	7.8	7.6	9.6	6.7	7.5	8.8	8.3	7.8	13.6	7.8	8.7	9.6	9.9	8.1	10.4
	Widowed %	4.3	4.1	3.4	5.2	3.8	3.7	5.7	3.9	2.7	4.4	4.1	2.9	3.3	4.4	2.9	3.4	4.6	5.2
Employment Status	Unemployed %	4.2	4.8	7.9	4.9	4.6	8.1	3.7	4.9	8.0	3.6	5.1	7.8	5.0	5.3	7.7	3.9	4.3	7.8
	Retired %	21.8	19.2	18.8	21.4	17.8	20.6	23.2	19.0	15.9	21.2	19.5	16.5	20.6	19.2	21.2	22.9	20.4	19.5
	Homemaker %	7.0	4.4	4.1	10.7	5.2	2.9	6.0	4.7	6.2	7.2	4.7	5.8	5.2	3.8	1.9	6.4	3.6	3.9
	Full-time Student %	3.5	1.7	2.5	4.9	1.9	3.7	5.4	1.8	2.7	3.6	1.7	1.0	2.6	1.5	2.9	2.0	1.5	1.3
	On leave/strike %	4.4	5.4	11.3	3.6	5.4	11.8	3.4	5.2	12.4	5.0	5.6	9.7	5.0	5.4	10.6	4.7	5.4	11.7
	Employed part-time %	18.0	12.6	13.1	16.2	11.6	12.5	21.1	11.3	12.4	16.5	12.0	13.6	17.3	14.4	14.4	19.0	13.8	13.0
	Employed full-time %	41.2	51.9	42.4	38.5	53.5	40.4	37.2	53.0	42.5	43.0	51.4	45.6	44.4	50.5	41.3	41.1	51.0	42.9
Household Income	< $30,000 %	24.8	20.9	28.2	25.2	20.9	32.4	25.8	21.3	26.5	22.6	20.4	26.2	23.9	20.8	26.0	26.8	21.1	28.6
	$30,000-$49,999 %	23.3	22.5	24.2	23.3	23.9	22.8	25.8	24.4	18.6	22.6	21.7	31.1	24.6	21.1	22.1	20.7	21.0	28.6
	$50,000-$89,999 %	32.6	36.0	31.9	34.0	37.5	33.8	29.9	34.5	35.4	34.4	36.7	27.2	31.4	35.6	30.8	33.3	35.4	31.2
	> $90,000 %	19.2	20.7	15.8	17.5	17.7	11.0	18.5	19.7	19.5	20.4	21.2	15.5	20.1	22.5	21.2	19.2	22.5	11.7
Household Debt *M (SD)* (Range: 1 - 43; 18 = $35,000)		15.9 (11.4)	18.2 (10.8)	17.2 (10.7)	15.6 (10.9)	17.8 (10.5)	16.3 (10.7)	15.8 (11.2)	18.2 (10.6)	18.6 (10.6)	16.3 (11.4)	18.3 (10.8)	16.2 (10.6)	16.3 (11.4)	18.3 (11.0)	17.7 (11.0)	15.3 (11.8)	18.4 (11.2)	17.4 (10.8)

[52] Weightings for the averages are derived as follows: NGs Average = 309/1799 (A1) + 298/1799 (A2) + 363/1799 (A3) + 423/1799 (A4) + 406/1799 (A5). NPGs Average = 3675/17256 (A1) + 3528/17256 (A2) + 3435/17256 (A3) + 3302/17256 (A4) + 3316/17256 (A5). PGs Average = 136/533 (A1) + 113/533 (A2) + 103/533 (A3) + 104/533 (A4) + 77/533 (A5). If less than 5 years of data are present, weights are adjusted accordingly.

[53] Depending on the variable, range either represents observed minimum and maximum values or *potential* minimum and maximum values.

		AVERAGE [52]			Assessment 1			Assessment 2			Assessment 3			Assessment 4			Assessment 5		
p < .05 (2 tail) p < .01 (2 tail)		NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
		n=360	n=3451	n=107	n=309	n=3675	n=136	n=298	n=3528	n=113	n=363	n=3435	n=103	n=423	n=3302	n=104	n=406	n=3316	n=77
PHYSICAL HEALTH																			
PHYSICAL FUNCTIONALITY	Disability or chronic health problem %	14.5	16.4	22.1	13.3	14.7	19.1	14.1	16.0	21.2	14.3	16.7	23.3	14.9	17.4	23.1	15.3	17.2	26.0
HEALTH STATUS	Physical health rating M (SD) (Range: 1 - 6; 6 = excellent)	4.73 (1.01)	4.53 (0.98)	4.26 (1.12)	4.96 (0.98)	4.70 (0.97)	4.46 (1.10)	4.80 (0.95)	4.55 (0.99)	4.22 (1.18)	4.72 (1.03)	4.51 (0.99)	4.21 (1.02)	4.65 (1.04)	4.42 (0.99)	4.14 (1.21)	4.61 (1.02)	4.45 (0.98)	4.19 (1.10)
	Currently taking Rx medication %	49.2	50.1	52.1	49.2	47.2	50.7	47.0	49.1	53.1	48.8	49.0	48.5	50.1	52.2	51.0	50.2	53.5	59.7
GAMBLING																			
GAMBLING ATTITUDES	Gambling Attitudes Measure M (SD) (Range: -4 to +4)	-0.94 (2.08)	1.18 (1.49)	0.75 (1.62)	-1.17 (2.07)	1.27 (1.52)	0.86 (1.68)	-1.22 (2.08)	1.11 (1.51)	0.86 (1.64)	-0.96 (2.05)	1.17 (1.47)	0.76 (1.50)	-0.76 (2.09)	1.18 (1.45)	0.71 (1.61)	-0.74 (2.11)	1.18 (1.48)	0.43 (1.66)
LIFETIME GAMBLING	Age first gambled M (SD) (Range: 3 - 75)	22.3 (9.2)	20.7 (8.6)	21.3 (10.4)	22.02 (9.08)	20.77 (8.68)	21.18 (10.36)	22.4 (9.2)	20.7 (8.7)	21.1 (9.7)	22.3 (8.9)	20.7 (8.6)	21.9 (11.0)	22.5 (9.3)	20.7 (8.6)	21.0 (10.7)	22.4 (9.3)	20.7 (8.5)	21.4 (10.5)
	Gambling frequency prior to 19 M (SD) (Range: 0-3; never to regularly)	.5 (.7)	.8 (.9)	1.0 (1.0)	0.41 (0.68)	0.85 (0.87)	1.04 (0.96)	.41 (0.7)	,84 (.9)	.95 (,95)	.49 (.73)	,84 (.87)	1.0 (1.0)	.48 (.74)	.84 (.86)	1.12 (1.0)	.50 (.73)	.85 (.87)	1.0 (.98)
	Big gambling wins or loss prior to 19 — Big win %	2.2	3.4	3.6	2.3	3.4	4.4	2.0	3.4	4.4	1.4	3.5	3.9	2.4	3.5	1.9	2.7	3.3	2.6
	Big loss %	.2	.5	1.5	0.0	0.6	1.5	0.3	0.5	0.9	0.3	0.5	1.9	0.5	0.5	1.0	0	0.6	2.6
	Big win & big loss %	1.1	1.6	8.5	0.6	1.7	7.4	0.7	1.6	8.8	0.8	1.5	7.9	1.4	1.5	6.7	1.5	1.5	13.0
	Parents or sibs regular gamblers when person was growing up %	9.9	20.6	28.5	10.4	20.4	28.7	7.4	20.5	28.3	9.6	20.6	29.1	11.3	20.6	27.9	10.3	20.8	28.6
	Parents or sibs occasionally or regularly gambled with person when growing up %	3.5	11.9	18.2	2.9	11.	16.2	3.0	11.6	20.4	3.9	11.8	17.5	4.0	11.9	20.2	3.4	12.1	16.9
	Parents or sibs problem gamblers when person was growing up %	1.2	2.3	6.0	1.9	2.3	5.9	0.3	2.3	8.0	0.8	2.4	5.8	1.2	2.2	2.9	1.5	2.4	7.8
	Largest single day loss ever ($) M (SD)	181 (1512)	627 (8294)	6236 (49505)	135 (1272)	530 (4269)	7469 (68683)	182 (1371)	527 (4317)	8931 (75349)	194 (1716)	743 (14283)	2560 (8686)	180 (1593)	791 (14612)	1625 (5996)	205 (1532)	555 (4493)	11251 (91075)
	Median	13	93	500	7	85	500	5	83	500	11	100	500	20	100	500	20	100	500
	Largest single day win ever ($) M (SD)	501 (5131)	3536 (58063)	4926 (15556)	215 (1283)	3826 (63222)	6229 (24786)	293 (1482)	3803 (63572)	2967 (3553)	484 (4377)	3867 (64512)	4460 (8878)	448 (4060)	3072 (49000)	6715 (28861)	940 (12531)	3051 (48833)	3706 (7832)
	Median	12.9	250	1894	5	250	2150	5	250	1600	10	250	2000	20	250	1700	20	250	2000
	Lifetime estimate of net win/loss ($) M (SD)	-536 (11327)	-506 (38713)	-33154 (167974)	-726 (8802)	-182 (47270)	-26673 (1.5E5)	-846 (9166)	-160 (48055)	-27256 (169236)	-395 (10369)	-140 (48563)	-38285 (171172)	-490 (9732)	-1005 (24056)	-34039 (168826)	-340 (17352)	-1118 (23682)	-45194 (192440
	Median	-17	-458	-3192	-10	-400	-3000	-5	-400	-3000	-20	-500	-2500	-20	-500	-3000	-25	-500	-5000
PAST YEAR GAMBLING — Frequency of gambling in typical month M (SD) 0.0 = not at all 0.5 = < 1/mo 1.0 = 1/month 2.5 = 2-3/mo 4.0 = 1/week 10 = 2-3/week 20 = ≥ 4/week (means and medians calculated for entire group, including individuals who did not engage in the format)	Lottery tickets	--	3.20 (3.72)	5.63 (6.14)	--	3.59 (3.73)	5.56 (5.71)	--	3.21 (3.72)	6.24 (6.74)	--	3.19 (3.89)	5.42 (5.89)	--	2.93 (3.62)	5.29 (5.98)	--	3.04 (3.61)	5.59 (6.55)
	Instant win tickets	--	1.47 (2.84)	4.29 (6.09)	--	1.94 (3.06)	4.43 (5.66)	--	1.45 (2.77)	4.61 (6.81)	--	1.43 (2.95)	4.52 (6.06)	--	1.27 (2.77)	3.62 (5.82)	--	1.22 (2.64)	4.16 (6.23)
	Bingo	--	0.24 (1.13)	1.40 (3.60)	--	0.35 (1.22)	1.46 (3.56)	--	0.23 (1.12)	1.73 (4.05)	--	0.21 (1.12)	1.43 (3.97)	--	0.20 (1.11)	1.17 (2.88)	--	0.21 (1.09)	1.08 (3.47)
	EGMs	--	0.45 (1.26)	1.81 (3.09)	--	0.63 (1.19)	2.14 (3.29)	--	0.44 (1.36)	1.67 (2.80)	--	0.41 (1.35)	1.28 (2.49)	--	0.37 (1.22)	1.95 (3.49)	--	0.38 (1.20)	1.94 (3.40)
	Casino table games	--	0.14 (0.98)	0.66 (2.51)	--	0.12 (0.67)	0.49 (2.00)	--	0.18 (1.19)	0.97 (3.21)	--	0.15 (1.10)	0.61 (2.44)	--	0.14 (1.00)	0.91 (3.51)	--	0.13 (0.93)	0.25 (1.15)
	Games of skill for money	--	0.59 (2.21)	1.77 (4.69)	--	0.59 (2.12)	1.47 (4.00)	--	0.63 (2.29)	1.50 (4.29)	--	0.57 (2.11)	1.60 (4.56)	--	0.59 (2.36)	2.17 (5.30)	--	0.56 (2.16)	2.36 (5.88)
	Sports betting	--	0.36 (1.71)	1.10 (3.85)	--	0.39 (1.77)	0.86 (3.49)	--	0.36 (1.62)	1.57 (4.67)	--	0.37 (1.81)	1.12 (4.02)	--	0.36 (1.72)	0.79 (3.00)	--	0.33 (1.60)	1.21 (4.17)
	Horse or dog racing	--	0.08 (0.58)	0.51 (2.51)	--	0.13 (0.79)	0.70 (2.83)	--	0.07 (0.52)	0.47 (2.31)	--	0.06 (0.55)	0.28 (1.99)	--	0.06 (0.41)	0.56 (2.93)	--	0.07 (0.61)	0.44 (2.34)

	AVERAGE [52]			Assessment 1			Assessment 2			Assessment 3			Assessment 4			Assessment 5		
p < .05 (2 tail) *p < .01 (2 tail)*	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
	n=360	*n*=3451	*n*=107	*n*=309	*n*=3675	*n*=136	*n*=298	*n*=3528	*n*=113	*n*=363	*n*=3435	*n*=103	*n*=423	*n*=3302	*n*=104	*n*=406	*n*=3316	*n*=77
High risk stocks	--	0.06 (0.62)	0.62 (2.99)	--	0.06 (0.63)	0.47 (2.60)	--	0.06 (0.52)	0.56 (2.71)	--	0.07 (0.69)	0.73 (3.10)	--	0.06 (0.56)	0.71 (3.39)	--	0.06 (0.69)	0.70 (3.37)
Other forms of gambling	--	0.11 (1.06)	0.30 (1.89)	--	0.13 (1.10)	0.35 (2.43)	--	0.11 (1.01)	0.26 (1.42)	--	0.09 (0.98)	0.07 (0.46)	--	0.09 (1.00)	0.51 (2.81)	--	0.11 (1.19)	0.26 (2.28)
Frequency of all forms combined *M (SD)* (Range: 0-30; capped at 30)	--	6.42 (6.67)	15.36 (9.90)	--	7.67 (6.82)	15.95 (9.26)	--	6.45 (6.74)	15.91 (10.54)	--	6.19 (6.76)	14.88 (9.79)	--	5.79 (6.47)	14.96 (10.02)	--	5.86 (6.51)	14.67 (10.10)
Gambled on Internet %	--	4.5	19.9	--	4.8	18.4	--	4.7	21.2	--	4.8	17.5	--	3.9	24.0	--	4.3	18.2
# of types of gambling engaged in *M (SD)* (Range: 0-10)	--	2.94 (1.45)	4.03 (1.45)	--	3.23 (1.57)	4.30 (1.49)	--	3.15 (1.54)	4.20 (1.51)	--	2.84 (1.40)	3.84 (1.31)	--	2.73 (1.36)	3.89 (1.54)	--	2.70 (1.36)	3.73 (1.36)
Lottery tickets	--	44 (5181)	-7656 (78594)	--	-19.36 (94.96)	-40.36 (116)	--	-39.96 (1250)	-84.55 (256)	--	-54.01 (522)	-787.68 (7386)	--	390.85 (24545)	-38510 (3.92*E*5)	--	-39.76 (539)	+264.04 (4120)
Median	--	-10.00	-18.72	--	-10.00	-15.00	--	-10.00	-20.00	--	-10.00	-20.00	--	-10.00	-20.00	--	-10.00	-20.00
Instant win tickets	--	-16.54 (341)	-7507 (78826)	--	-7.60 (39.30)	-4.57 (202)	--	-23.59 (480)	-20.77 (352)	--	-28.68 (868)	286.83 (10813)	--	-10.38 (98.57)	-38495 (3.9*E*5)	--	-12.50 (224)	-324.01 (3548)
Median	--	-1.45	-9.12	--	-3.00	-10.00	--	-3.00	-10.00	--	-1.00	-10.00	--	0.00	-5.50	--	0.00	-10.00
Bingo	--	-6.85 (92.59)	-12.27 (366)	--	-6.17 (75.71)	-35.47 (148)	--	-8.22 (72.50)	-53.73 (156)	--	-6.06 (114)	-44.43 (132)	--	-8.69 (165)	-34.23 (112)	--	-5.15 (38.49)	+162.18 (1717)
Median	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00
EGMs	--	-50.82 (1335)	-11463 (1.2*E*5)	--	-19.10 (114)	-136.98 (384)	--	-95.94 (2436)	-218.18 (428)	--	-22.51 (388)	-404.81 (2025)	--	-24.97 (340)	-57951 (5.9*E*5)	--	-92.99 (3490)	+13.53 (1797)
Median	--	0.00	-51.48	--	0.00	-50.00	--	0.00	-80.00	--	0.00	-50.00	--	0.00	-25.00	--	0.00	-50.00
Casino table games	--	-6.79 (160)	-46.57 (328)	--	-4.80 (77.03)	-35.90 (178)	--	-14.67 (265)	-30.33 (264)	--	-7.65 (195)	-32.03 (114)	--	-2.28 (198)	-109.33 (988)	--	-4.18 (65.87)	-23.96 (81.73)
Median	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00
Games of skill for money	--	-6.94 (179)	-105.97 (924)	--	-2.81 (53.90)	-98.66 (869)	--	-13.10 (282)	-94.51 (978)	--	-10.53 (234)	-64.06 (504)	--	-2.51 (207)	-189.46 (1562)	--	-5.67 (126)	-79.03 (640)
Median	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00
Sports betting	--	-3.08 (162)	-85.67 (711)	--	-2.14 (25.36)	-9.13 (36.79)	--	-12.14 (316)	-27.89 (127)	--	3.92 (378)	-185.77 (1724)	--	-2.15 (38.77)	-6.21 (63.93)	--	-2.65 (49.51)	-279.09 (2280)
Median	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00
Horse or dog racing	--	-3.81 (87.04)	-69.44 (542)	--	-2.60 (29.66)	-65.34 (391)	--	-7.82 (196)	-26.87 (189)	--	-3.37 (89.33)	-20.35 (158)	--	-1.58 (19.83)	-160.82 (1474)	--	-3.54 (99.55)	-81.40 (579)
Median	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00
High risk stocks	--	-25.52 (3778)	+171.20 (3195)	--	+85.12 (3337)	+185.86 (952)	--	+20.82 (1300)	-61.73 (1067)	--	-193.23 (4747)	+381.40 (11130)	--	-111.00 (8008)	+156.30 (1078)	--	+61.42 (1682)	+226.10 (2530)
Median	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00
Other forms of gambling	--	-7.35 (676)	-31.80 (324)	--	-36.33 (2313)	-5.77 (108)	--	6.93 (688)	-4.48 (24.60)	--	-0.85 (10.95)	+1.26 (20.47)	--	-3.17 (141)	-151.42 (1471)	--	-1.30 (67.47)	-0.52 (4.56)
Median	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00	--	0.00	0.00
Expenditure on all forms combined *M (SD)*	--	-83.59 (8328)	-26807 (32131)	--	-15.80 (4068)	-246.33 (1638)	--	-187.70 (3801)	-623.05 (1577)	--	-322.97 (4916)	-869.63 (17368)	--	224.11 (25831)	-135451 (1.4*E*5)	--	-106.31 (3959)	-122.16 (4881)
Median	--	-23.07	-261.61	--	-24.00	-242.50	--	-27.00	-300.00	--	-22.00	-230.00	--	-20.00	-270.00	--	-22.00	-270.00
Expenditure on all forms combined category (Range 0 - 16)	--	1.8 (2.5)	5.4 (4.8)	--	1.7 (2.1)	4.8 (4.2)	--	1.9 (2.4)	5.9 (5.0)	--	2.0 (2.9)	6.0 (5.4)	--	1.8 (2.5)	5.0 (4.6)	--	1.8 (2.4)	5.8 (4.8)
Largest single day loss ($) *M (SD)*	--	131.67 (2085)	808.86 (1870)	--	93.03 (486)	571.53 (1011)	--	145.52 (1410)	791.42 (1543)	--	230.45 (6853)	1303.5 (4429)	--	93.32 (570)	688.01 (1273)	--	95.6 (1143)	755.45 (1250)
Median	--	15.17	314.45	--	20.00	300.00	--	20.00	300.00	--	15.00	300.00	--	10.00	300.00	--	10.00	400.00

Row group label (left margin): **PAST YEAR GAMBLING** — **Gambling Expenditure $ (net win/loss in typical month) M (SD)** (means and medians calculated for entire group, including individuals who did not engage in the format)

		AVERAGE [52]			Assessment 1			Assessment 2			Assessment 3			Assessment 4			Assessment 5		
p < .05 (2 tail)	*p < .01 (2 tail)*	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
		n=360	*n=3451*	*n=107*	*n=309*	*n=3675*	*n=136*	*n=298*	*n=3528*	*n=113*	*n=363*	*n=3435*	*n=103*	*n=423*	*n=3302*	*n=104*	*n=406*	*n=3316*	*n=77*
	Largest single day loss category (Range 0 - 7)	--	.9 (.8)	2.4 (1.4)	--	1.0 (.7)	2.3 (1.3)	--	1.0 (.8)	2.4 (1.5)	--	.9 (.8)	2.3 (1.5)	--	.9 (.8)	2.4 (1.3)	--	.9 (.7)	2.5 (1.4)
	Largest single day win ($) *M (SD)*	--	799.51 (19707)	2323 (9756)	--	606.55 (16536)	1105 (1696)	--	782.41 (1581)	1581 (2659)	--	462.19 (3942)	3028 (10615)	--	1790 (73272)	3817 (26914)	--	394.67 (5497)	2602 (10088)
	Median	--	23.22	636.06	--	30.00	600.00	--	30.00	662.00	--	20.00	700.00	--	15.00	692.50	--	20.00	500.00
	Largest single day win category (Range 0 - 7)	--	1.2 (1.3)	3.0 (1.8)	--	1.3 (1.3)	2.9 (1.7)	--	1.3 (1.4)	3.0 (1.9)	--	1.2 (1.3)	3.1 (2.0)	--	1.2 (1.3)	2.9 (1.7)	--	1.1 (1.3)	3.0 (1.8)
	Member of gambling rewards program %	--	24.1	58.9	--	--	--	--	22.4	57.5	--	24.3	57.3	--	25.0	58.7	--	25.0	63.6
	Frequency of ATM use in gambling venues *M (SD)* (Range: 0-4)	--	0.73 (0.95)	2.12 (1.24)				--	0.76 (0.98)	2.15 (1.26)	--	0.74 (0.95)	2.13 (1.28)	--	0.70 (0.94)	2.03 (1.23)	--	0.70 (0.94)	2.20 (1.18)
GAMBLING MOTIVATION	Excitement/ entertainment/fun %	--	61.5	60.2	--	65.8	61.8	--	63.1	69.0	--	60.3	54.4	--	58.8	57.7	--	59.1	55.8
	Win money %	--	30.8	50.9	--	30.8	48.5	--	31.5	54.9	--	30.3	51.5	--	29.6	50.0	--	31.5	49.4
	Escape/distraction %	--	4.0	22.4	--	4.1	20.6	--	5.1	24.8	--	3.5	21.4	--	3.8	21.2	--	3.6	24.7
	Socialize %	--	14.5	9.2	--	13.9	8.1	--	16.3	10.6	--	13.8	7.8	--	13.9	10.6	--	14.5	9.1
	Support worthy causes %	--	8.8	3.4	--	9.5	4.4	--	9.9	4.4	--	8.2	3.9	--	7.8	2.9	--	8.6	0.0
	To feel good about self %	--	0.6	3.9	--	0.7	3.7	--	0.6	3.5	--	0.6	3.9	--	0.5	5.8	--	0.7	2.6
	Other reason %	--	4.1	3.0	--	3.3	2.9	--	4.0	3.5	--	4.1	2.9	--	4.4	2.9	--	4.9	2.6
GAMBLING CONTEXT	Alone or with friends *M (SD)* (Range: 1-5; 1 = always alone)	--	4.17 (1.23)	3.27 (1.43)	--	4.23 (1.15)	3.46 (1.35)	--	4.19 (1.21)	3.30 (1.39)	--	4.13 (1.26)	3.23 (1.48)	--	4.15 (1.29)	3.23 (1.47)	--	4.15 (1.24)	3.01 (1.53)
	Drink alcohol when gambling *M (SD)* (Range: 0-4; never to always)	--	0.90 (1.13)	0.71 (1.10)	--	0.96 (1.13)	0.83 (1.15)	--	0.95 (1.16)	0.85 (1.12)	--	0.90 (1.13)	0.57 (0.99)	--	0.84 (1.11)	0.62 (1.14)	--	0.83 (1.11)	0.61 (1.08)
	Smoke/use tobacco when gambling *M (SD)* (Range: 0-4)	--	0.87 (1.42)	1.45 (1.64)	--	0.98 (1.49)	1.73 (1.72)	--	0.91 (1.44)	1.47 (1.62)	--	0.83 (1.40)	1.36 (1.59)	--	0.80 (1.38)	1.31 (1.66)	--	0.84 (1.40)	1.22 (1.59)
	Use [street] drugs when gambling *M (SD)* (Range: 0-4)	--	0.09 (0.43)	0.25 (0.74)	--	0.09 (0.45)	0.29 (0.85)	--	0.08 (0.41)	0.21 (0.66)	--	0.09 (0.43)	0.18 (0.65)	--	0.08 (0.41)	0.27 (0.72)	--	0.09 (0.45)	0.31 (0.83)
GAMBLING SOCIAL EXPOSURE	# of close friends & family who are regular gamblers *M (SD)* (Range: 0-4)	0.92 (0.95)	1.40 (0.79)	1.87 (0.91)	0.99 (0.96)	1.38 (0.98)	1.88 (0.91)	0.81 (0.92)	1.43 (0.95)	1.87 (0.90)	0.94 (0.96)	1.43 (0.95)	1.72 (0.96)	0.94 (0.97)	1.38 (0.96)	1.98 (0.91)	0.92 (0.95)	1.36 (.09)	1.90 (0.86)
	# of close friends and family with gambling problems *M (SD)* (Range: 0-4)	0.17 (0.50)	0.20 (0.51)	0.81 (0.99)	0.20 (0.53)	0.20 (0.51)	0.79 (0.94)	0.16 (0.49)	0.21 (0.51)	0.84 (1.01)	0.16 (0.45)	0.20 (0.51)	0.76 (0.97)	0.18 (0.54)	0.20 (0.53)	0.69 (0.90)	0.17 (0.50)	0.19 (0.50)	1.03 (1.21)
	Other adults in household with gambling problems *M (SD)* (Range: 0-5)	0.01 (0.08)	0.02 (0.17)	0.22 (0.57)	0.01 (0.11)	0.02 (0.16)	0.16 (0.45)	0.00 (0.00)	0.02 (0.19)	0.14 (0.46)	0.00 (0.05)	0.02 (0.17)	0.26 (0.69)	0.00 (0.07)	0.02 (0.18)	0.22 (0.44)	0.02 (0.14)	0.02 (0.17)	0.37 (0.98)
	Opportunity to gamble at workplace or school *M (SD)* (Range: 0-3)	0.50 (0.85)	0.46 (0.84)	0.42 (0.88)	0.55 (0.88)	0.54 (0.90)	0.39 (0.87)	0.50 (0.84)	0.49 (0.87)	0.53 (0.99)	0.51 (0.86)	0.45 (0.82)	0.49 (0.98)	0.44 (0.82)	0.41 (0.80)	0.28 (0.75)	0.53 (0.84)	0.42 (0.80)	0.38 (0.80)
	Exposed to prevention or awareness campaigns at workplace (or school) %	3.3	4.9	7.9	3.6	5.8	7.4	2.3	4.4	9.7	2.5	4.8	7.8	3.6	5.1	8.7	4.0	4.5	5.2
GAMBLING FALLACIES	Gambling Fallacies Measure *M (SD)* (Range: 0-10: 10 = no fallacies)	7.44 (1.14)	7.14 (1.36)	6.32 (1.43)	7.22 (1.31)	6.88 (1.48)	6.19 (1.88)	7.49 (1.16)	7.14 (1.37)	6.22 (1.86)	--	--	--	7.44 (1.27)	7.24 (1.33)	6.63 (1.90)	7.57 (1.13)	7.33 (1.24)	6.30 (2.08)
GAMBLING AVAILABILITY	Driving time (minutes) to nearest EGM venue *M (SD)* (Range: 0-188)	74.78 (19.83)	72.53 (19.46)	68.20 (20.67)	75.27 (17.51)	73.24 (18.31)	69.57 (19.39)	75.14 (20.01)	72.93 (18.57)	68.31 (21.26)	74.26 (20.54)	72.27 (19.37)	67.58 (20.11)	74.49 (19.89)	71.93 (20.34)	68.37 (19.69)	74.91 (20.75)	72.09 (20.87)	66.20 (24.16)
	Distance (km) to nearest EGM venue *M (SD)* (Range: 0-216)	93.94 (28.05)	90.86 (28.20)	85.64 (31.00)	95.18 (25.33)	92.33 (26.80)	87.86 (28.95)	94.69 (28.12)	91.83 (27.12)	84.74 (31.76)	93.29 (29.13)	90.62 (28.28)	85.32 (29.93)	93.59 (28.38)	89.76 (29.18)	86.37 (30.47)	93.39 (28.75)	89.47 (29.79)	82.51 (35.62)
	Participant estimate of distance to nearest EGM venue *M (SD)* (Range: 1-10; 1 = 0-10 kms; 10 = >90 kms)	7.81 (2.70)	7.43 (2.62)	6.77 (2.77)	--	--	--	--	--	--	--	--	--	7.83 (2.73)	7.48 (2.61)	6.88 (2.74)	7.78 (2.66)	7.38 (2.63)	6.61 (2.81)

		AVERAGE [52]			Assessment 1			Assessment 2			Assessment 3			Assessment 4			Assessment 5		
p < .05 (2 tail)	*p < .01 (2 tail)*	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
		n=360	*n*=3451	*n*=107	*n*=309	*n*=3675	*n*=136	*n*=298	*n*=3528	*n*=113	*n*=363	*n*=3435	*n*=103	*n*=423	*n*=3302	*n*=104	*n*=406	*n*=3316	*n*=77
PERSONALITY																			
PERSONALITY TRAITS NEO-FFI/NEO-PI-R Raw Scores *M (SD)*	Neuroticism	16.8 (7.8)	17.1 (7.3)	21.8 (8.0)	16.7 (8.1)	17.1 (7.3)	22.7 (8.2)	16.6 (7.8)	17.1 (7.3)	21.7 (7.8)	16.6 (7.8)	17.2 (7.3)	21.4 (8.1)	17.0 (7.6)	17.1 (7.3)	21.4 (7.7)	17.0 (7.7)	17.1 (7.3)	21.3 (8.1)
	Depression	11.7 (5.8)	11.8 (5.4)	15.3 (6.0)	11.7 (5.6)	11.8 (5.4)	15.9 (6.1)	11.8 (5.5)	11.7 (5.4)	15.1 (5.7)	11.6 (6.7)	11.8 (5.4)	15.0 (6.0)	11.9 (5.6)	11.8 (5.4)	15.3 (5.9)	11.7 (5.4)	11.8 (5.4)	15.1 (6.3)
	Vulnerability	8.9 (4.2)	9.0 (4.0)	10.7 (4.6)	8.9 (4.4)	9.0 (4.0)	11.3 (4.8)	8.9 (4.2)	9.0 (4.0)	10.5 (4.6)	8.7 (4.2)	9.0 (4.0)	10.6 (4.6)	9.0 (4.2)	9.0 (4.0)	10.4 (4.3)	9.1 (4.1)	9.0 (4.0)	10.6 (4.9)
	Impulsivity	13.7 (4.7)	14.2 (4.2)	17.3 (3.9)	13.4 (4.7)	14.2 (4.2)	17.7 (4.0)	13.7 (4.9)	14.2 (4.2)	17.2 (4.0)	13.7 (4.7)	14.2 (4.2)	17.0 (3.8)	13.6 (4.7)	14.2 (4.2)	17.0 (4.0)	13.8 (4.6)	14.2 (4.2)	17.4 (3.5)
	Extraversion	27.2 (5.1)	27.6 (4.7)	27.2 (5.0)	27.2 (5.3)	27.6 (4.7)	27.2 (5.1)	27.2 (5.0)	27.6 (4.7)	27.3 (4.9)	27.2 (5.0)	27.6 (4.7)	26.9 (5.0)	27.2 (5.0)	27.6 (4.8)	27.6 (4.9)	27.2 (5.1)	27.6 (4.7)	27.1 (4.9)
	Excitement-seeking	15.7 (4.5)	17.8 (4.1)	18.0 (4.1)	15.4 (4.4)	17.8 (4.2)	18.1 (4.2)	15.3 (4.5)	17.7 (4.1)	18.0 (4.1)	15.8 (4.6)	17.7 (4.1)	17.9 (4.1)	15.8 (4.5)	17.8 (4.1)	18.3 (4.4)	16.0 (4.4)	17.8 (4.1)	17.6 (4.3)
	Openness	28.9 (6.4)	27.4 (5.6)	27.3 (3.2)	29.1 (6.3)	27.5 (5.7)	26.0 (5.3)	29.2 (6.6)	27.4 (5.6)	26.5 (6.3)	29,0 (6.5)	27.4 (5.6)	27.9 (6.3)	28.6 (6.4)	27.4 (5.6)	28.8 (5.8)	28.9 (6.3)	27.4 (5.6)	27.6 (5.7)
	Agreeableness	34.1 (5.7)	33.0 (5.3)	31.3 (5.9)	34.3 (5.7)	32.9 (5.3)	30.8 (6.0)	34.5 (5.6)	32.9 (5.3)	31.1 (6.1)	34.2 (5.6)	33.0 (5.3)	31.4 (6.2)	33.9 (5.6)	33.0 (5.3)	32.0 (5.8)	33.7 (5.8)	33.0 (5.3)	31.1 (5.3)
	Conscientiousness	33.7 (5.4)	33.6 (5.0)	32.1 (5.5)	33.5 (5.7)	33.6 (5.0)	31.2 (5.6)	33.8 (5.4)	33.6 (5.0)	32.1 (5.6)	33.9 (5.4)	33.5 (5.0)	31.8 (5.5)	33.7 (5.3)	33.6 (5.0)	32.5 (5.4)	33.5 (5.3)	33.6 (5.0)	33.5 (5.1)
STRESS																			
PAST YEAR STRESS	Number of stressful life events *M (SD)* (Range: 0-58)	2.43 (2.45)	2.45 (2.49)	3.78 (3.40)	3.27 (2.85)	3.27 (2.94)	4.83 (4.34)	2.43 (2.24)	2.48 (2.55)	4.11 (3.43)	2.41 (2.50)	2.27 (2.42)	3.35 (3.18)	2.19 (2.41)	2.14 (2.29)	3.36 (3.20)	2.08 (2.28)	2.00 (2.20)	2.55 (2.28)
WELL BEING	Stress level *M (SD)* (Range: 1-7; higher scores = higher stress)	4.12 (1.27)	4.00 (1.21)	4.51 (1.22)	4.19 (1.21)	4.04 (1.20)	4.40 (1.28)	4.00 (1.20)	3.98 (1.22)	4.60 (1.23)	4.16 (1.32)	3.93 (1.22)	4.41 (1.22)	4.11 (1.31)	4.01 (1.23)	4.59 (1.10)	4.13 (1.26)	4.04 (1.20)	4.60 (1.25)
	Happiness level *M (SD)* (Range: 1-7; higher scores = more happiness)	4.72 (1.05)	4.73 (1.00)	4.17 (1.05)	4.75 (0.95)	4.77 (0.98)	4.32 (1.04)	4.75 (1.00)	4.74 (0.99)	4.22 (1.02)	4.71 (1.11)	4.74 (1.02)	4.00 (1.02)	4.71 (1.06)	4.66 (1.03)	4.17 (0.94)	4.71 (1.10)	4.72 (1.00)	4.09 (1.27)
	Life satisfaction *M (SD)* (Range: 1-7)	4.81 (1.10)	4.75 (1.04)	4.14 (1.08)	4.86 (1.01)	4.76 (1.03)	4.26 (1.07)	4.83 (1.03)	4.75 (1.02)	4.26 (1.03)	4.82 (1.14)	4.77 (1.06)	3.96 (1.09)	4.75 (1.11)	4.70 (1.04)	4.10 (1.00)	4.82 (1.16)	4.74 (1.03)	4.05 (1.28)
	Personal Wellness Index *M (SD)* (Range: 0-70)	50.08 (11.86)	48.84 (11.49)	39.86 (13.53)	--	--	--	--	--	--	50.13 (12.30)	48.95 (11.43)	39.36 (14.47)	49.71 (12.12)	48.55 (11.61)	40.70 (12.52)	50.42 (11.21)	49.01 (11.43)	39.39 (13.63)
LIFETIME STRESS	Abused as a child %	27.5	20.5	22.8	27.8	20.7	22.8	30.2	20.5	25.7	28.9	20.2	27.2	24.3	20.5	27.9	27.2	20.5	5.5
	Prefer not to say whether abused %	5.1	5.5	9.4	3.6	5.6	11.0	3.7	5.7	8.0	5.5	5.5	8.7	6.4	5.3	8.7	5.4	5.5	10.4
	Other past trauma that still has present day effect %	13.7	26.7	36.0	33.0	26.6	39.0	29.9	27.0	31.9	29.5	26.8	39.8	32.4	26.5	37.5	33.3	26.6	29.9
VALUES																			
Most important in life	Money %	6.6	11.0	27.6	--	--	--	--	--	--	--	--	--	9.3	11.4	24.0	3.7	10.7	32.5
	Power %	0.3	0.3	1.7	--	--	--	--	--	--	--	--	--	0.5	0.4	0.0	0.0	0.3	3.9
	Fame %	0.1	0.1	0.0	--	--	--	--	--	--	--	--	--	0.0	0.1	0.0	0.2	0.1	0.0
	Friendships %	68.0	67.6	51.4	--	--	--	--	--	--	--	--	--	67.0	67.4	55.8	69.1	67.7	45.5
	None of the above %	25.1	20.9	19.3	--	--	--	--	--	--	--	--	--	23.3	20.6	20.2	26.9	21.2	18.2
Wealth indicates success *M (SD)* (Range: 1-5: higher scores denote greater agreement)		3.5 (1.0)	3.21 (0.97)	2.76 (0.98)	--	--	--	--	--	--	--	--	--	3.50 1.06	3.21 0.99	2.76 1.04	3.55 0.99	3.21 0.95	2.75 0.89

		AVERAGE [52]			Assessment 1			Assessment 2			Assessment 3			Assessment 4			Assessment 5		
p < .05 (2 tail) *p < .01 (2 tail)*		NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
		n=360	*n=3451*	*n=107*	*n=309*	*n=3675*	*n=136*	*n=298*	*n=3528*	*n=113*	*n=363*	*n=3435*	*n=103*	*n=423*	*n=3302*	*n=104*	*n=406*	*n=3316*	*n=77*
MENTAL HEALTH																			
MENTAL DISORDERS	Post-Traumatic Stress %	2.3	2.0	8.4	3.2	2.7	9.6	2.0	1.4	10.6	2.8	1.9	8.7	2.6	2.0	7.7	1.2	2.1	3.9
	Major Depressive Disorder %	12.5	11.7	30.9	13.3	13.3	27.9	11.8	11.8	35.4	13.0	11.4	30.1	13.1	11.2	28.8	11.4	10.4	33.8
	Manic Episode %	0.5	0.6	1.3	1.3	0.6	2.2	0.3	0.6	0.0	0.3	0.6	0.0	0.2	0.4	1.0	0.7	0.6	3.9
	Generalized Anxiety %	3.9	4.0	13.7	2.9	3.4	11.0	7.1	4.5	15.0	3.0	4.5	14.6	4.0	3.6	16.3	3.2	4.2	11.7
	Panic Attacks &/or Agoraphobia %	4.8	5.5	14.1	4.9	5.4	12.5	4.7	5.7	20.4	6.4	5.5	9.7	4.8	5.3	13.5	3.2	5.4	14.3
	Obsessive Compulsive Disorder %	0.7	0.8	5.1	1.0	1.0	6.6	1.0	0.7	5.3	1.1	0.7	4.9	0.5	0.8	2.9	0.2	0.7	5.2
	Bulimia %	1.2	0.8	2.1	1.0	0.9	2.9	1.3	0.9	2.7	1.4	0.9	1.0	1.7	0.6	1.9	0.5	0.7	1.3
	Schizophrenic or Delusional %	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.2	0.0	0.0	0.0	0.0	1.3
	Any mental health problem %	17.1	16.6	41.3	18.8	18.3	42.6	17.8	16.6	44.2	17.7	16.6	37.9	17.6	15.9	38.5	14.3	15.3	42.9
SUBSTANCE USE, ABUSE, AND DEPENDENCE	Tobacco user %	20.0	37.9	54.5	19.4	40.6	61.8	18.5	37.9	57.1	21.1	37.3	51.5	20.7	36.5	51.0	19.8	36.9	46.8
	Alcohol user%	63.1	74.7	64.7	63.4	77.8	70.6	61.6	76.5	65.2	61.5	74.3	64.1	64.8	72.1	65.4	63.7	72.5	53.2
	Illicit drug user %	9.2	11.8	24.0	4.9	6.5	21.3	9.4	13.3	23.2	11.9	14.3	26.2	9.5	13.2	29.8	9.4	12.3	19.5
	≥ Weekly use of tobacco, alcohol, illicit drugs or nonmedical licit %	35.5	49.7	43.8	37.2	53.3	48.5	39.4	51.8	50.0	33.5	47.3	43.7	34.0	47.5	41.3	34.6	47.9	29.9
	Substance abuse or dependence %	4.2	6.1	20.4	2.9	4.2	14.0	1.3	3.8	13.4	1.4	2.8	10.7	2.4	3.2	9.6	2.7	3.2	11.7
BEHAVIOURAL ADDICTION (over-eating; sex or pornography; exercise; shopping; Internet chat lines; video/Internet gaming; other) %		3.6	4.6	17.1	2.9	4.6	16.2	3.4	5.2	16.2	3.0	5.0	19.4	4.3	4.2	19.2	4.2	4.0	14.3
LIFETIME[54] MENTAL HEALTH	Lifetime personal history of addiction to drugs/alcohol %	6.1	7.0	17.6	6.1	6.9	23.5	5.4	7.0	16.8	6.1	7.1	14.6	6.1	7.0	14.4	6.7	6.8	16.9
	Lifetime personal history of behavioural addiction %	7.6	4.1	10.5	8.1	4.1	14.0	6.7	4.3	9.7	8.0	4.0	11.7	8.7	3.9	7.7	6.2	4.3	7.8
	Parents/siblings have history of addiction %	25.9	23.6	29.7	25.2	23.6	28.7	26.5	23.8	28.3	25.3	23.8	27.2	25.8	23.5	30.8	26.7	23.5	35.1
	Lifetime personal history of mental health problems %	17.9	11.7	23.8	17.8	11.7	28.7	18.1	11.8	23.0	17.1	11.8	24.3	18.2	11.6	21.2	18.0	11.6	19.5
	Parents/siblings have history of mental health problems %	17.3	11.9	18.2	17.5	12.0	16.2	19.1	11.9	17.7	16.0	12.0	18.4	17.0	11.8	18.3	17.3	11.8	22.1
SOCIAL FUNCTIONING																			
	Heterosexual %	96.4	96.0	91.6				--	--	--	--	--	--	--	--	--	--	--	--
SOCIAL FUNCTIONING AND SUPPORT	Marital Satisfaction Scale *M (SD)* (Range: 3-21; higher scores indicate greater satisfaction)	17.02 (4.10)	16.97 (4.02)	15.54 (4.35)	17.97 (3.33)	17.54 (3.71)	16.07 (4.50)	17.16 (3.91)	17.05 (3.98)	16.03 (4.29)	16.77 (4.41)	16.76 (4.18)	14.77 (4.27)	16.83 (4.29)	16.70 (4.17)	14.91 (4.85)	16.62 (4.33)	16.71 (4.08)	15.74 (3.61)
	PAI Social Non-Support Scale *M (SD)* (Range: 0-24; higher scores indicate low support)	4.14 (3.61)	4.01 (3.61)	6.56 (4.14)	4.18 (3.42)	4.06 (3.43)	6.41 (4.20)	3.84 (3.40)	3.88 (3.57)	6.34 (4.21)	4.29 (3.72)	4.03 (3.61)	7.12 (4.12)	4.45 (3.89)	4.05 (3.69)	6.18 (3.90)	3.86 (3.53)	4.05 (3.77)	6.92 (4.30)
	Family functioning *M (SD)* (Range: 1-7: higher scores = ↑ functioning)	5.55 (1.22)	5.54 (1.21)	5.01 (1.36)	5.57 (1.20)	5.60 (1.22)	5.18 (1.30)	5.63 (1.22)	5.58 (1.21)	5.01 (1.32)	5.48 (1.25)	5.51 (1.20)	4.78 (1.41)	5.55 (1.27)	5.50 (1.21)	5.13 (1.44)	5.54 (1.16)	5.51 (1.21)	4.88 (1.34)
COMMUNITY QUALITY AND INVOLVEMENT *M (SD)* (Range: 6-30; higher scores indicate greater involvement and quality)		21.69 (4.27)	20.89 (4.07)	19.39 (4.24)	21.99 (3.94)	21.01 (3.95)	20.14 (4.06)	22.20 (3.93)	20.97 (4.06)	18.94 (4.21)	21.79 (4.41)	20.84 (4.14)	19.03 (4.42)	21.17 (4.60)	20.84 (4.08)	19.72 (4.18)	21.54 (4.29)	20.73 (4.14)	18.73 (4.46)

---

[54] Prior to past 12 months

			AVERAGE [52]			Assessment 1			Assessment 2			Assessment 3			Assessment 4			Assessment 5		
p < .05 (2 tail)	*p* < .01 (2 tail)		NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
			n=360	*n*=3451	*n*=107	*n*=309	*n*=3675	*n*=136	*n*=298	*n*=3528	*n*=113	*n*=363	*n*=3435	*n*=103	*n*=423	*n*=3302	*n*=104	*n*=406	*n*=3316	*n*=77
RELIGION	Religious affiliation	Catholic %	13.4	22.1	17.3	11.3	21.9	14.7	11.4	21.9	19.5	13.8	22.2	16.5	13.7	22.3	20.2	15.6	22.4	15.6
		Protestant %	51.7	55.4	54.6	55.3	54.8	61.8	52.3	55.3	57.5	51.2	55.5	53.4	50.8	55.9	47.1	50.1	55.6	49.4
		Atheist or Agnostic %	10.2	7.2	9.8	5.2	3.8	3.7	5.7	3.7	2.7	5.5	3.6	4.9	6.1	3.4	6.7	4.9	3.6	10.4
		Other %[55]	17.8	8.2	7.2	18.8	8.3	7.4	20.8	8.1	2.7	17.6	8.2	7.8	16.5	8.0	10.6	16.3	8.2	7.9
		No answer %	6.9	6.6	10.9	4.9	7.1	9.6	6.4	6.7	7.1	6.1	6.6	12.8	8.3	6.3	8.7	7.9	6.3	19.4
	Religiosity Scale *M* (*SD*) (Range: 0-26; higher scores indicate greater belief)		15.4 (8.6)	11.8 (6.7)	11.7 (6.6)	16.48 (8.61)	11.75 (6.70)	11.51 (6.18)	16.2 (8.6)	11.8 (6.7)	12.7 (6.9)	15.0 (8.7)	11.9 (6.7)	11.7 (6.2)	14.7 (8.6)	11.9 (6.6)	11.6 (6.9)	15.1 (8.4)	11.8 (6.7)	10.6 (6.8)
RECREATIONAL ACTIVITIES	Gambling is 1 of 5 favourite leisure activities %		0.0	9.6	50.2	0.0	16.0	66.9	0.0	6.8	37.8	0.0	9.4	39.8	0.0	8.0	51.0	0.0	7.5	52.0
	Gambling is person's favourite leisure activity %		0.0	1.0	13.0	0.0	1.6	21.3	0.0	0.3	8.1	0.0	1.2	7.8	0.0	1.2	12.5	0.0	0.8	13.0
OCCUPATIONAL FUNCTIONING	Job stress *M* (*SD*) (Range: 1-7; extremely low to extremely high)		4.17 (1.28)	4.17 (1.31)	4.45 (1.44)	4.31 (1.28)	4.15 (1.33)	4.18 (1.59)	4.16 (1.26)	4.16 (1.34)	4.73 (1.44)	4.20 (1.33)	4.17 (1.33)	4.35 (1.34)	4.14 (1.21)	4.20 (1.26)	4.53 (1.38)	4.09 (1.31)	4.18 (1.27)	4.57 (1.39)
	Job satisfaction *M* (*SD*) (Range: 1-7)		4.64 (1.18)	4.55 (1.17)	4.37 (1.27)	4.52 (1.19)	4.56 (1.20)	4.68 (1.21)	4.71 (1.19)	4.53 (1.19)	4.28 (1.48)	4.59 (1.27)	4.54 (1.19)	3.86 (1.17)	4.74 (1.13)	4.54 (1.15)	4.53 (1.17)	4.63 (1.14)	4.55 (1.13)	4.43 (1.35)
ILLEGAL BEHAVIOUR AND ANTISOCIALITY	# of Illegal activities in lifetime *M* (*SD*) (Range: 0-14)		.67 (1.4)	.74 (1.5)	1.0 (1.6)	0.67 (1.42)	0.74 (1.50)	1.13 (1.85)	.61 (1.3)	.74 (1.5)	1.1 (1.7)	.74 (1.5)	.74 (1.5)	.69 (1.2)	.66 (1.4)	.73 (1.5)	1.0 (1.6)	.65 (1.4)	.73 (1.5)	1.1 (1.8)
	# of Illegal activities in past year *M* (*SD*) (Range: 0-14)		0.03 (0.22)	0.05 (0.30)	0.14 (0.47)	0.06 (0.28)	0.11 (0.48)	0.28 (0.71)	0.02 (0.19)	0.04 (0.26)	0.07 (0.29)	0.02 (0.22)	0.04 (0.32)	0.09 (0.45)	0.03 (0.22)	0.03 (0.20)	0.08 (0.39)	0.02 (0.18)	0.03 (0.24)	0.13 (0.47)
	PAI Antisocial Features Raw Score *M* (*SD*)		9.7 (7.1)	11.3 (7.7)	14.6 (8.6)	9.55 (7.1)	11.32 (7.8)	15.5 (9.2)	9.4 (6.6)	11.3 (7.8)	14.1 (7.9)	9.7 (7.0)	11.3 (7.7)	13.7 (8.2)	9.8 (7.3)	11.2 (7.6)	14.8 (9.1)	10.0 (7.3)	11.2 (7.7)	15.0 (8.5)
INTELLIGENCE																					
Stanford-Binet Matrices raw score *M (SD)*			18.7 (7.8)	17.5 (5.2)	16.2 (5.1)	19.1 (4.8)	17.5 (5.2)	16.1 (5.1)	19.1 (4.8)	17.5 (5.2)	16.1 (5.1)	19.0 (4.8)	17.4 (5.2)	16.5 (5.1)	18.3 (5.3)	17.5 (5.2)	16.4 (5.1)	18.4 (17.6)	17.6 (5.1)	15.9 (5.4)
Stanford-Binet Matrices standard score category	Above average %		12.1	6.0	3.9	11.7	6.2	3.3	13.2	6.0	4.7	12.5	5.9	4.9	11.0	6.1	2.9	12.2	6.0	4.0
	Average %		75.5	78.2	70.1	77.7	78.0	70.7	75.7	78.1	69.2	76.9	78.0	71.8	74.8	78.3	70.9	73.3	78.7	66.7
	Below average %		12.4	15.7	26.0	10.7	15.6	26.0	11.1	15.9	26.2	10.6	16.1	23.3	14.1	15.6	26.2	14.5	15.3	29.3

[55] The 'Other religion' category includes Muslim, Jewish, Buddhist, Hindu, Sikh, and Other affiliations.

Appendix G: Independent Variable Correlates of Non-Gamblers (NGs), Non-Problem Gamblers (NPGs), and CPGI 5+ Problem Gamblers (PG) in LLLP

p < .05 (2 tail)   p < .01 (2 tail)

		Average Data			Assessment 1			Assessment 2			Assessment 3			Assessment 4		
		NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
		n=240	n=846	n=42	n=312	n=1010	n=50	n=217	n=881	n=47	n=221	n=726	n=37	n=208	n=767	n=34
DEMOGRAPHICS																
Male %		37.9	42.6	55.4	28.8	48.3	53.1	47.7	40.1	54.7	40.6	39.8	61.4	38.3	40.7	53.0
Age M (SD) (Baseline range[56]: 18-66)		39.0 (18.4)	41.6 (17.0)	39.2 (14.1)	37.2 (18.4)	38.2 (17.0)	34.2 (13.3)	37.1 (18.1)	41.5 (17.1)	40.7 (15.4)	40.5 (18.5)	43.3 (17.0)	41.1 (14.2)	42.0 (18.5)	44.7 (17.0)	42.6 (13.4)
Initial Age Category	18-20 %	27.6	21.5	24.0	27.6	21.5	24.0	--	--	--	--	--	--	--	--	--
	23-25 %	26.0	24.5	26.0	26.0	24.5	26.0	--	--	--	--	--	--	--	--	--
	43-45 %	19.9	31.5	44.0	19.9	31.5	44.0	--	--	--	--	--	--	--	--	--
	63-65 %	26.6	22.6	6.0	26.6	22.6	6.0	--	--	--	--	--	--	--	--	--
Immigrant %		14.6	10.1	6.5	14.4	9.7	6.0	13.8	10.4	6.4	14.9	9.9	5.4	15.4	10.4	8.8
Ethnicity (participants able to choose more than 1 category)	Aboriginal/Métis/Inuit %	4.8	6.0	6.0	4.8	6.0	6.0	--	--	--	--	--	--	--	--	--
	Canadian %	6.4	11.3	4.0	6.4	11.3	4.0	--	--	--	--	--	--	--	--	--
	African %	0.3	0.2	0	0.3	0.2	0	--	--	--	--	--	--	--	--	--
	Asian (Eastern) %	4.2	2.8	8.0	4.2	2.8	8.0	--	--	--	--	--	--	--	--	--
	Asian (Southern) %	3.2	1.8	2.0	3.2	1.8	2.0	--	--	--	--	--	--	--	--	--
	Asian (Western) %	1.6	0.6	0	1.6	0.6	0	--	--	--	--	--	--	--	--	--
	European (Northern) %	21.5	17.5	12.0	21.5	17.5	12.0	--	--	--	--	--	--	--	--	--
	European (Eastern) %	15.7	18.0	6.0	15.7	18.0	6.0	--	--	--	--	--	--	--	--	--
	European (Western) %	71.2	70.1	50.0	71.2	70.1	50.0	--	--	--	--	--	--	--	--	--
	Latin American %	0.3	0.2	0	0.3	0.2	0	--	--	--	--	--	--	--	--	--
	Other ethnicity %	3.2	2.6	0	3.2	2.6	0	--	--	--	--	--	--	--	--	--
Non-Caucasian %		10.5	8.4	16.8	10.9	9.1	16.0	12.0	7.8	17.4	10.4	7.6	16.2	8.2	8.8	17.6
Adopted %		3.0	2.7	7.1	3.5	2.8	8.0	2.8	2.8	6.4	2.3	2.8	5.4	3.4	2.2	8.8
Educational Attainment	< High school graduation %	6.7	6.9	13.1	8.0	8.8	16.0	6.5	7.0	12.8	7.8	5.6	13.5	3.8	5.5	8.8
	High school graduate %	12.9	12.5	14.3	19.2	19.7	22.0	9.7	10.3	12.8	9.6	8.8	8.1	10.1	9.1	11.8
	Some post-secondary %	31.8	27.7	28.5	33.0	32.1	26.0	39.2	28.4	34.0	28.2	26.6	29.7	26.0	22.0	23.5
	Completed vocational school or college %	14.7	22.4	20.2	12.8	17.1	24.0	13.4	24.9	19.1	14.6	24.0	18.9	18.8	25.1	17.6
	University Bachelor's degree %	22.5	22.1	21.4	17.6	16.4	10.0	20.7	21.1	19.1	26.5	26.2	24.3	27.4	26.9	38.2
	Graduate or professional degree %	11.5	8.4	2.4	9.3	5.9	2.0	10.6	8.3	2.1	13.2	8.8	5.4	13.9	11.4	0.0
Marital Status	Never married %	37.9	34.3	36.3	43.6	40.8	46.0	43.3	34.7	25.5	32.7	30.9	40.5	29.3	28.6	32.4
	Married %	44.0	42.4	29.2	36.5	39.0	18.0	41.9	42.0	36.2	47.7	45.6	27.0	53.4	44.5	38.2
	Living common-law %	6.6	10.9	16.1	7.4	9.5	16.0	6.5	10.2	17.0	6.4	11.3	18.9	5.8	13.0	11.8
	Separated or divorced %	10.0	9.1	17.3	11.2	7.8	20.0	7.4	9.8	19.2	11.4	9.0	10.8	9.6	9.9	17.7
	Widowed %	1.5	3.3	1.2	1.3	2.9	0	0.9	3.3	2.1	1.8	3.2	2.7	1.9	4.0	0
Employment Status	Unemployed %	38.5	28.4	31.0	35.3	28.4	30.0	36.9	28.9	27.7	39.1	28.1	40.5	44.4	28.3	26.5
	Employed part-time %	24.0	20.4	15.5	29.2	22.7	22.0	25.8	20.7	19.1	21.4	19.7	8.1	16.9	17.6	8.8
	Employed full-time %	37.5	51.2	53.6	35.6	48.9	48.0	37.3	50.4	53.2	39.5	52.2	51.4	38.6	54.0	64.7
	Attending school %	27.5	17.8	19.0	29.8	24.4	24.0	31.3	19.0	27.7	25.9	14.2	16.2	21.6	11.0	2.9
Household income	$0-$19,999 %	11.7	6.0	9.5	9.9	5.9	12.0	11.5	6.9	2.1	12.2	5.4	8.1	13.9	5.5	17.6
	$20,000-$29,999 %	6.5	5.6	9.5	6.4	5.2	10.0	6.9	6.0	6.4	6.3	5.8	16.2	6.3	5.5	5.9

---

[56] Depending on the variable, range either represents observed minimum and maximum values or *potential* minimum and maximum values.

		Average Data			Assessment 1			Assessment 2			Assessment 3			Assessment 4		
p < .05 (2 tail) p < .01 (2 tail)		NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
		n=240	n=846	n=42	n=312	n=1010	n=50	n=217	n=881	n=47	n=221	n=726	n=37	n=208	n=767	n=34
	$30,000-$39,999 %	9.4	7.2	4.8	8.3	6.6	2.0	11.5	8.5	4.3	7.7	6.6	5.4	10.6	7.0	8.8
	$40,000-$49,999 %	7.7	8.2	7.1	5.8	8.2	8.0	8.8	8.2	6.4	8.1	8.8	5.4	9.1	7.7	8.8
	$50,000-$59,999 %	8.1	8.8	10.1	7.4	8.0	12.0	6.9	7.8	12.8	9.0	9.2	8.1	9.6	10.6	5.9
	$60,000-$79,999 %	16.7	16.5	14.3	18.9	15.0	12.0	18.4	18.4	23.4	15.4	15.4	8.1	13.0	17.3	11.8
	More than $80,000 %	39.9	47.7	44.6	43.3	51.1	44.0	35.9	44.2	44.7	41.2	48.8	48.6	37.5	46.4	41.2
Household debt ($) M (SD)		58242 (178238)	59404 (115897)	72858 (111354)	14109 (56366)	17727 (59375)	7281 (22966)	62762 (225461)	71746 (149792)	84835 (140415)	84484 (203655)	72162 (111490)	98741 (163999)	91845 (284773)	88032 (155567)	124574 (143872)
Location	Calgary %	43.8	42.5	53.0	45.2	40.8	48.0	45.6	43.2	57.4	41.2	43.4	51.4	42.8	43.0	55.9
	Edmonton %	27.6	30.5	30.4	29.8	29.5	28.0	27.2	30.9	27.7	26.7	31.0	35.1	25.5	31.0	32.4
	Grande Prairie %	10.3	12.5	5.3	8.3	14.0	6.0	11.5	11.8	2.1	12.2	12.0	10.8	10.1	12.0	2.9
	Lethbridge %	18.3	14.4	11.3	16.7	15.7	18.0	15.7	14.1	12.8	19.9	13.6	2.7	21.6	14.0	8.8
PHYSICAL HEALTH																
PHYSICAL FUNCTIONALITY	Perceptual, communicative, motor, or learning impairment %	23.0	21.7	36.3	23.4	22.3	36.0	23.0	22.0	31.9	22.6	20.8	37.8	22.6	21.5	41.2
HEALTH STATUS	Physical health rating M (SD) (Range: 1 - 6; 6 = excellent)	4.6 (1.1)	4.7 (1.0)	4.2 (1.2)	4.7 (1.0)	4.7 (1.0)	4.2 (1.1)	4.7 (1.2)	4.7 (1.1)	4.2 (1.2)	4.6 (1.2)	4.6 (1.0)	4.2 (1.2)	4.5 (1.2)	4.6 (1.1)	4.0 (1.2)
	Currently taking Rx medication %	45.9	48.3	49.3	--	--	--	--	--	--	45.7	48.6	56.8	46.2	48.1	41.2
GAMBLING																
GAMBLING ATTITUDES	Gambling Attitudes Measure M (SD) (Range: -4 to +4)	-1.0 (2.0)	0.5 (1.7)	0.2 (1.8)	-1.1 (2.0)	0.4 (1.7)	-0.6 (1.7)	-1.0 (2.1)	0.5 (1.7)	0.3 (2.0)	-1.0 (1.9)	0.6 (1.7)	0.8 (1.4)	-0.9 (2.0)	0.7 (1.7)	0.6 (1.9)
	Gambling Attitudes Questionnaire M (SD) (Range: 1-7; lower scores indicate belief gambling harmless)	4.4 (1.1)	4.0 (1.0)	4.0 (1.0)	4.2 (1.2)	3.9 (1.1)	3.7 (1.1)	4.4 (1.0)	4.1 (0.9)	4.1 (0.9)	4.4 (1.0)	4.1 (1.0)	4.2 (1.1)	4.5 (1.0)	4.0 (1.0)	4.0 (1.0)
LIFETIME GAMBLING	Age first gambled M (SD)	19.5 (9.1)	18.4 (7.3)	17.4 (7.9)	21.5 (11.0)	18.8 (8.0)	16.7 (6.8)	18.3 (8.2)	18.3 (6.8)	18.6 (9.0)	19.0 (8.2)	18.2 (7.1)	16.6 (7.5)	18.2 (8.2)	18.3 (7.3)	17.5 (8.3)
	Big win when first started gambling %	13.2	22.9	57.2	15.0	26.7	52.0	14.5	21.8	57.5	10.3	21.6	54.1	12.1	20.2	67.7
	Big loss when first started gambling %	7.5	10.0	35.7	8.3	11.2	40.0	8.4	9.7	36.2	6.5	10.4	24.3	6.4	8.6	41.2
	* Parent(s)/sibling(s) do/did gamble regularly [57] %	14.6	24.6	50.6	15.7	25.6	44.0	15.2	23.4	48.9	14.9	23.7	54.1	12.0	25.4	58.8
	* Parent(s) gambled with person when growing up %	14.8	30.8	45.8	11.6	32.7	46.0	14.9	30.2	44.7	16.8	29.7	48.6	17.3	30.1	44.1
	* Parent(s) are/were problem gambler(s) %	2.5	6.4	17.3	2.9	7.2	20.0	2.3	5.9	19.1	3.2	5.8	8.1	1.4	6.3	20.6
	* Siblings are/were problem gamblers %	3.1	3.6	10.7	3.8	4.1	6.0	2.8	3.7	10.6	2.7	3.6	8.1	2.9	2.9	20.6
	Largest amount lost in one single year $ M (SD)	1067 (9985)	736 (5345)	7212 (12917)	96 (407)	294 (761)	1153 (1260)	491 (3033)	937 (10467)	5525 (8416)	729 (3649)	986 (4574)	8672 (18422)	3484 (38336)	849 (6229)	16866 (30292)
	Median	23	106	1804	20	100	1000	20	100	2000	30	100	2000	25	125	2500
Frequency of gambling M (SD) 1 = Not in past year 2 = 1-5/year 3 = 6-11/year 4 = 1/month	Lottery tickets	--	2.85 (1.77)	3.75 (2.11)	--	1.47 (1.3)	2.62 (2.4)	--	3.39 (2.0)	3.96 (2.2)	--	3.29 (2.0)	4.03 (1.8)	--	3.63 (1.9)	4.82 (1.9)
	Raffle or fund-raising tickets	--	2.49 (1.33)	2.40 (1.46)	--	1.99 (1.1)	1.88 (1.5)	--	2.08 (1.1)	2.17 (1.1)	--	1.93 (.92)	2.08 (1.1)	--	4.13 (2.3)	3.85 (2.3)
	Instant win tickets	--	2.07 (1.47)	2.90 (1.97)	--	2.28 (1.7)	2.44 (2.1)	--	2.12 (1.5)	3.04 (1.8)	--	1.90 (1.3)	3.19 (1.9)	--	1.88 (1.3)	3.09 (2.1)
	Bingo	--	1.16 (.69)	1.51 (1.3)	--	1.22 (.88)	1.62 (1.6)	--	1.16 (.63)	1.53 (1.3)	--	1.13 (.56)	1.41 (1.1)	--	1.12 (.61)	1.41 (1.1)

---

[57] Asterisks indicate question only asked to people losing >$365 in any year, betting >10 times in life, and endorsing at least one of 15 problems associated with gambling (survey questions 227.A-241.O).

			Average Data			Assessment 1			Assessment 2			Assessment 3			Assessment 4		
p < .05 (2 tail) *p < .01 (2 tail)*			NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
			n=240	*n=846*	*n=42*	*n=312*	*n=1010*	*n=50*	*n=217*	*n=881*	*n=47*	*n=221*	*n=726*	*n=37*	*n=208*	*n=767*	*n=34*
PAST YEAR GAMBLING	5 = 2-3/month 6 = 1/week 7 = 2-6/week 8 = daily (means and medians calculated for entire group, including individuals who did not engage in the format)	EGMs	--	1.58 (1.01)	3.14 (1.93)	--	1.60 (1.1)	3.94 (2.2)	--	1.61 (1.0)	2.87 (1.8)	--	1.58 (1.0)	2.65 (1.7)	--	1.51 (.93)	2.85 (1.97)
		Casino table games	--	1.27 (.75)	2.33 (1.74)	--	1.32 (.87)	2.96 (2.2)	--	1.25 (.75)	1.98 (1.6)	--	1.19 (.55)	1.92 (1.5)	--	1.32 (.79)	2.32 (1.5)
		Private games for money	--	1.72 (1.3)	2.51 (1.77)	--	1.87 (1.5)	3.02 (2.2)	--	1.70 (1.3)	2.43 (1.8)	--	1.57 (1.15)	2.24 (1.6)	--	1.67 (1.2)	2.18 (1.3)
		Sport betting	--	1.35 (1.01)	2.14 (1.8)	--	1.36 (1.1)	2.78 (2.3)	--	1.29 (.89)	1.64 (1.5)	--	1.33 (.95)	1.86 (1.6)	--	1.42 (1.1)	2.21 (1.7)
		Horse races	--	1.11 (.43)	1.39 (1.04)	--	1.12 (.47)	1.46 (1.2)	--	1.11 (.43)	1.13 (.34)	--	1.08 (.4)	1.38 (1.1)	--	1.14 (.4)	1.65 (1.7)
		High risk stocks	--	1.28 (.80)	1.40 (.80)	--	1.16 (.76)	1.02 (.14)	--	1.12 (.57)	1.15 (.63)	--	1.13 (.61)	1.16 (.73)	--	1.77 (1.3)	2.57 (2.1)
		Casinos outside Alberta	--	1.18 (.50)	1.45 (.93)	--	1.13 (.43)	1.36 (.83)	--	1.18 (.43)	1.38 (.71)	--	1.24 (.67)	1.62 (1.2)	--	1.2 (.49)	1.5 (1.1)
	Frequency, all forms in past year *M (SD)* (Range: 0-30)		--	2.9 (4.9)	8.0 (7.8)	--	3.1 (5.7)	9.8 (9.1)	--	2.9 (4.3)	7.1 (6.8)	--	2.8 (4.5)	6.6 (7.4)	--	4.29 (1.47)	5.59 (1.50)
	Gambled on Internet in any form %		--	13.7	26.8	--	9.0	24.0	--	14.8	25.5	--	15.6	27.0	--	16.8	32.4
	# of types of gambling engaged in *M (SD)* (Range: 0-13)		--	3.2 (1.8)	5.2 (2.2)	--	2.7 (1.8)	4.8 (2.3)	--	3.7 (1.9)	5.3 (2.0)	--	3.4 (1.9)	5.6 (2.3)	--	3.2 (1.7)	5.1 (2.1)
	Gambling Expenditure $ (net win/loss in typical month) *M (SD)* (Note: actual values used in Assessments 1 and 2 and absolute values used in Assessments 3 and 4) (Means and medians only calculated for people participating in format)	Lottery tickets	--	-89.58 (834)	-56.30 (89)	--	missing data	missing data	--	-35.87 (129)	-65.63 (129)	--	-191.92 (2391)	-32.10 (40)	--	-54.41 (169)	-69.75 (88)
		Median	--	-14.76	-29.47	--	--	--	--	-10.00	-27.50	--	-15.00	-20.00	--	-20.00	-42.50
		Raffle or fund-raising tickets	--	-29.88 (421)	-22.12 (83.9)	--	-15.02 (50)	-21.42 (50)	--	-31.25 (1405)	-3.35 (172)	--	-40.16 (98)	-34.19 (50)	--	-38.14 (84)	-35.95 (49)
		Median	--	-8.51	-12.21	--	-5.00	-5.00	--	-10.00	-16.00	--	-10.00	-10.00	--	-10.00	-20.00
		Instant win tickets	--	-17.48 (70)	-42.18 (153)	--	-14.63 (81)	-3.71 (62)	--	-10.02 (55)	-34.23 (167)	--	-25.53 (78)	-44.77 (126)	--	-22.20 (64)	-106.92 (295)
		Median	--	-7.21	-17.16	--	-5.00	-5.50	--	-5.00	-20.00	--	-10.00	-17.50	--	-10.00	-30.00
		Bingo	--	-46.70 (111)	-93.96 (258)	--	-56.14 (108)	+3.33 (249)	--	-12.74 (114)	-127.50 (313)	--	-55.82 (118)	-103.75 (202)	--	-64.66 (103)	-180.00 (258)
		Median	--	-21.16	-58.57	--	-25.00	-60.00	--	-10.00	-45.00	--	-20.00	-45.00	--	-30.00	-90.00
		EGMs	--	-55.22 (314)	-1076.70 (3874)	--	-48.96 (337)	-117.18 (1104)	--	-1.48 (336)	-1.66 (1165)	--	-92.59 (293)	-400.00 (851)	--	-89.80 (278)	-4710.27 (14981)
		Median	--	-17.40	-65.95	--	-20.00	-25.00	--	-10.00	-40.00	--	-20.00	-100.00	--	-20.00	-125.00
		Casino table games	--	-112.69 (810)	-206.87 (776)	--	-62.70 (132)	+72.59 (567)	--	+18.38 (394)	-77.89 (657)	--	-365.98 (2896)	-407.50 (636)	--	-89.30 (208)	-577.78 (1400)
		Median	--	-31.81	-78.57	--	-30.00	-75.00	--	-20.00	-50.00	--	-40.00	-100.00	--	-40.00	-100.00
		Private games for money	--	-27.16 (153)	-22.16 (197)	--	-55.89 (173)	-68.00 (110)	--	+32.85 (232)	+106.87 (434)	--	-39.05 (68)	-78.13 (109)	--	-47.02 (117)	-72.18 (91)
		Median	--	-14.79	-26.15	--	-20.00	-50.00	--	0	0	--	-20.00	-28.21	--	-20.00	-25.00
		Sport betting	--	-36.05 (155)	-149.06 (489)	--	-27.35 (68)	-123.76 (641)	--	+8.44 (140)	-21.36 (250)	--	-45.03 (105)	-99.69 (162)	--	-90.11 (335)	-416.54 (953)
		Median	--	-9.92	-31.37	--	-10.00	-25.00	--	-1.00	-10.00	--	-10.00	-50.00	--	-20.00	-50.00
		Horse races	--	-28.03 (62)	-116.37 (161)	--	-29.35 (63)	-30.75 (158)	--	-15.72 (73)	-135.00 (170)	--	-35.12 (77)	-40.83 (34)	--	-33.74 (35)	-298.75 (293)
		Median	--	-17.40	-84.60	--	-20.00	-7.50	--	-10.00	-62.50	--	-20.00	-35.00	--	-20.00	-282.50

p < .05 (2 tail) p < .01 (2 tail)

	Average Data			Assessment 1			Assessment 2			Assessment 3			Assessment 4		
	NGs n=240	NPGs n=846	PGs n=42	NGs n=312	NPGs n=1010	PGs n=50	NGs n=217	NPGs n=881	PGs n=47	NGs n=221	NPGs n=726	PGs n=37	NGs n=208	NPGs n=767	PGs n=34
PAST YEAR GAMBLING — High risk stocks	--	-1224 (17121)	-10528 (4274)	--	-3293	Only 1 value	--	+2555 (19374)	-5750 (7365)	--	-6229.41 (11580)	Only 2 values	--	-5565.08 (14533)	-17133 (28468)
Median	--	-485	-3695	--	--	--	--	+137.40	-5500	--	--	--	--	-1200.00	-1200.00
Casinos outside Alberta	--	-132.09 (584)	-187.16 (500)	--	-177.08 (676)	-51.44 (164)	--	-9.76 (424)	-56.54 (850)	--	-152.80 (352)	-324.00 (484)	--	-193.74 (867)	-418.42 (529)
Median	--	-31.15	-96.96	--	-24.00	-60.00	--	-20.00	-20.00	--	-40.00	-150.00	--	-45.00	-200.00
Expenditure on all forms combined M (SD)	--	-597.27 (3968)	-2563.99 (7851)	--	-376.50 (2539)	-822.80 (1129)	--	-767.07 (5292)	-1635.14 (2880)	--	-735.81 (4253)	-3442.57 (16363)	--	-561.83 (4061)	-5452.47 (15343)
Median	--	-62.36	-556.70	--	-33.00	-496.00	--	-100.00	-750.00	--	-60.00	-375.00	--	-60.00	-576.50
Expenditure on all forms combined category (Range 0-7)	--	1.78 (1.41)	3.55 (1.76)	--	1.54 (1.26)	3.44 (1.57)	--	2.05 (1.48)	4.02 (1.80)	--	1.79 (1.48)	3.19 (1.83)	--	1.79 (1.48)	3.44 (1.93)
Median	--	1.26	3.63	--	1	3.5	--	2	4	--	1	3	--	1	4
Largest single day loss in past year ($) M (SD)	--	715 (5870)	1969 (4810)	--	653.76 (4242)	699.22 (746)	--	902.66 (8740)	1686.64 (4507)	--	736.43 (6562)	844.78 (1006)	--	561.83 (4061)	5452 (15343)
Median	--	56	516	--	42.00	437.50	--	64.00	510.00	--	60.00	572.00	--	60.00	576.50
Total time (minutes) on all types of gambling per occasion M SD	--	163.3 (231)	497.0 (408)	--	180.4 (254)	458.3 (337)	--	180.94 (244)	482.5 (378)	--	156.8 (239)	481.1 (345)	--	126.6 (180)	591.3 (621)
GAMBLING MOTIVATION[58] M (SD) (Range: 1-4; 1=a lot; 4=not at all) — For excitement	--	2.97 (.91)	1.93 (.94)	missing data	missing data	missing data	missing data	missing data	missing data	--	2.94 (.90)	1.86 (.95)	--	3.0 (.91)	2.0 (.92)
To relax/have fun	--	2.61 (.99)	1.79 (.89)	missing data	missing data	missing data	missing data	missing data	missing data	--	2.60 (.98)	1.70 (.78)	--	2.61 (1.0)	1.88 (1.0)
To win money	--	2.48 (.99)	1.58 (.85)	missing data	missing data	missing data	missing data	missing data	missing data	--	2.48 (.98)	1.57 (.80)	--	2.47 (1.0)	1.59 (.89)
To be with friends/make new friends	--	2.94 (1.1)	2.96 (1.1)	missing data	missing data	missing data	missing data	missing data	missing data	--	2.97 (1.1)	2.97 (1.0)	--	2.91 (1.1)	2.94 (1.1)
Drink alcohol or use drugs when gambling M (SD) (Range: 0-4; never to most of the time)	--	0.7 (1.1)	1.4 (1.4)	--	0.8 (1.2)	2.1 (1.6)	missing data	missing data	missing data	--	0.6 (1.0)	1.3 (1.3)	--	0.7 (1.1)	1.0 (1.2)
Dissociate when gambling M (SD) (Range: 1-4; 1= often, 4= never) — Lose track of time	--	3.48 (.77)	2.03 (1.0)	missing data	missing data	missing data	missing data	missing data	missing data	--	3.46 (.8)	2.14 (1.0)	--	3.5 (.74)	1.91 (.94)
Go into trance-like state	--	3.89 (.40)	2.83 (1.3)	missing data	missing data	missing data	missing data	missing data	missing data	--	3.89 (.39)	2.78 (1.3)	--	3.89 (.4)	2.88 (1.2)
Feel outside body as if watching self gamble	--	3.1 (.6)	3.1 (1.1)	missing data	missing data	missing data	missing data	missing data	missing data	--	2.14 (1.0)	2.78 (1.3)	--	3.98 (.16)	3.41 (.96)
GAMBLING SOCIAL EXPOSURE — Percentage of close friends that gamble regularly M (SD)	8.2 (13.1)	15.3 (23.5)	25.4 (27.9)	8.3 (15.9)	20.1 (27.0)	26.2 (29.7)	missing data	missing data	missing data	5.5 (12.5)	12.8 (22.0)	24.9 (23.7)	5.4 (12.3)	13.4 (22.1)	20.7 (28.7)
Amount of gambling at work or school M (SD) (Range: 1-4; 1= a lot)	1.62 (.78)	1.80 (.76)	1.84 (.83)	1.66 (.84)	1.82 (.83)	1.98 (.91)	missing data	missing data	missing data	1.55 (.76)	1.74 (.74)	1.73 (.67)	1.64 (.75)	1.84 (.72)	1.80 (.91)
Attended information session on problem gambling %	1.4	2.5	1.8	3.5	4.1	6.0	0	2.9	0	0.5	1.7	0	0.6	0.8	0
GAMBLING FALLACIES — Gambling Fallacies Measure M (SD) (Range: 0-10: 10 = no fallacies)	7.3 (1.3)	7.2 (1.4)	6.3 (1.7)	6.7 (1.5)	6.7 (1.6)	6.3 (1.9)	7.4 (1.5)	7.2 (1.4)	6.0 (1.7)	7.5 (1.2)	7.4 (1.3)	6.2 (1.8)	7.7 (1.1)	7.6 (1.3)	6.7 (1.5)
GAMBLING AVAILABILITY — Casino/racino density M (SD) (Range: 0-4; number within 5 km)	0.5 (0.8)	0.6 (0.9)	0.8 (0.8)	0.5 (0.9)	0.6 (0.9)	1.1 (1.2)	0.5 (0.8)	0.5 (0.8)	0.6 (0.9)	0.5 (0.8)	0.6 (0.8)	0.7 (1.2)	0.5 (0.8)	0.6 (0.9)	0.5 (1.0)

[58] Respondents were asked to recall motivation in the year of their most frequent gambling. Response was limited to those losing > $365 in any year, betting > 10 times in lifetime, and endorsing at least one of 15 problems associated with gambling (survey questions 227.A-241.O).

		Average Data			Assessment 1			Assessment 2			Assessment 3			Assessment 4		
p < .05 (2 tail) *p* < .01 (2 tail)		NGs *n*=240	NPGs *n*=846	PGs *n*=42	NGs *n*=312	NPGs *n*=1010	PGs *n*=50	NGs *n*=217	NPGs *n*=881	PGs *n*=47	NGs *n*=221	NPGs *n*=726	PGs *n*=37	NGs *n*=208	NPGs *n*=767	PGs *n*=34
Casino/racino driving distance (km) *M (SD)* (Range: 0.2-449.3)		17.0 (30.3)	15.5 (30.5)	20.2 (51.0)	15.9 (32.7)	15.8 (34.1)	17.7 (64.2)	18.7 (40.8)	15.1 (29.8)	20.0 (65.3)	16.9 (24.8)	15.4 (29.1)	21.9 (73.9)	17.0 (21.8)	15.6 (27.7)	22.1 (77.1)
PERSONALITY																
PERSONALITY TRAITS NEO-FFI/NEO-PI-R Raw Scores *M (SD)*	Neuroticism	74.6 (23.1)	74.6 (18.6)	89.6 (23.3)	75.4 (23.6)	74.9 (23.7)	94.1 (23.6)	74.4 (21.7)	74.5 (4.0)	86.2 (23.5)	74.0 (23.2)	74.4 (23.8)	90.4 (23.8)	74.3 (23.9)	74.7 (23.7)	86.9 (22.0)
	Depression	12.1 (6.0)	11.6 (5.9)	15.7 (6.3)	12.3 (6.1)	11.7 (5.9)	16.8 (6.6)	11.9 (5.7)	11.6 (6.0)	14.8 (6.2)	12.0 (6.0)	11.4 (5.9)	15.6 (6.2)	12.0 (6.2)	11.5 (5.9)	15.5 (6.2)
	Vulnerability	10.0 (4.2)	9.5 (4.3)	11.7 (4.2)	9.9 (4.2)	9.6 (4.3)	12.7 (4.4)	10.0 (4.2)	9.5 (4.3)	11.0 (4.1)	10.1 (4.2)	9.4 (4.3)	11.8 (4.1)	9.9 (4.2)	9.5 (4.3)	11.3 (4.1)
	Impulsivity	15.1 (4.7)	15.6 (4.6)	18.6 (4.9)	15.3 (4.8)	15.7 (4.6)	19.0 (4.9)	15.2 (4.6)	15.5 (4.6)	18.2 (4.9)	14.9 (4.7)	15.6 (4.6)	19.0 (4.8)	14.8 (4.6)	15.7 (4.6)	18.1 (5.3)
	Extraversion	112.8 (21.3)	116.9 (18.5)	114.2 (20.6)	112.5 (20.4)	118.0 (18.7)	113.4 (24.0)	114.5 (21.8)	116.5 (18.4)	113.6 (17.5)	112.5 (21.4)	116.4 (18.3)	114.7 (19.9)	111.8 (22.0)	116.6 (18.4)	115.5 (20.4)
	Excitement-seeking	16.4 (5.5)	18.5 (5.1)	20.1 (5.0)	16.5 (5.6)	18.9 (5.1)	20.9 (5.4)	16.7 (5.6)	18.3 (5.2)	19.7 (4.4)	16.3 (5.4)	18.3 (5.1)	19.4 (5.1)	16.1 (5.5)	18.3 (5.1)	20.2 (5.1)
	Openness	30.4 (6.4)	30.3 (6.2)	28.5 (6.2)	30.3 (6.5)	30.5 (6.1)	28.1 (6.3)	30.5 (6.4)	30.3 (6.2)	29.3 (6.1)	30.0 (6.5)	30.3 (6.2)	28.5 (6.1)	30.8 (6.3)	30.1 (6.2)	28.2 (6.3)
	Agreeableness	33.8 (5.6)	33.4 (5.6)	31.2 (5.8)	33.7 (5.9)	33.2 (5.6)	29.9 (5.7)	33.6 (5.6)	33.5 (5.6)	32.3 (6.1)	34.0 (5.4)	33.4 (5.6)	31.3 (5.5)	34.1 (5.5)	33.5 (5.6)	31.5 (5.7)
	Conscientiousness	34.0 (6.0)	33.6 (6.3)	31.3 (6.3)	34.0 (6.2)	33.5 (6.5)	29.5 (6.3)	34.3 (6.2)	33.7 (6.5)	32.3 (6.4)	34.0 (5.4)	33.4 (5.6)	31.3 (5.5)	33.9 (6.3)	33.9 (6.5)	32.6 (6.8)
STRESS																
PAST YEAR STRESS	Life Events Scale *M (SD)* (Range: 0-42)[59]	7.2 (4.1)	7.1 (4.2)	9.1 (4.9)	14.5 (6.2)	15.2 (6.9)	18.6 (7.4)	4.2 (3.3)	3.9 (3.2)	5.1 (3.6)	3.5 (3.2)	3.5 (3.0)	5.5 (4.4)	3.3 (2.8)	3.3 (3.0)	4.5 (3.6)
	PAI Level of Stress *M (SD)*	5.6 (4.0)	5.6 (4.1)	9.1 (4.8)	5.6 (4.0)	5.6 (4.1)	9.1 (4.8)	--	--	--	--	--	--	--	--	--
Coping Inventory for Stressful Situations *M (SD)* (Range: 21-105; higher scores = more coping strategies)		61.0 (11.1)	60.1 (11.7)	63.6 (9.8)	--	--	--	62.9 (10.6)	61.5 (11.6)	66.8 (8.9)	59.2 (12.0)	59.4 (11.3)	62.4 (10.2)	60.9 (10.8)	59.0 (12.1)	60.6 (10.7)
WELL BEING	Happiness level *M (SD)* (Range: 0-10; higher scores = more happiness)	7.7 (2.2)	7.5 (2.1)	6.0 (2.3)	--	--	--	--	--	--	7.7 (2.2)	7.5 (2.1)	5.9 (2.4)	7.7 (2.2)	7.5 (2.1)	6.1 (2.2)
	Life satisfaction *M (SD)* (Range: 0-10)	7.7 (1.9)	7.6 (1.9)	6.0 (2.3)	--	--	--	--	--	--	7.7 (1.9)	7.5 (1.9)	5.9 (2.4)	7.7 (2.0)	7.6 (1.9)	6.1 (2.1)
	Personal Wellness Index *M (SD)* (Range: 0-100)	75.1 (17.6)	72.9 (16.5)	58.6 (18.4)	--	--	--	--	--	--	75.2 (17.6)	72.2 (16.4)	56.7 (19.8)	74.9 (17.6)	73.5 (16.5)	60.7 (16.9)
LIFETIME STRESS	Childhood Trauma Score *M (SD)*	35.8 (13.2)	36.7 (12.7)	44.1 (17.6)	36.2 (13.0)	37.1 (13.2)	44.5 (19.3)	35.6 (13.6)	36.7 (12.6)	43.2 (17.2)	35.8 (13.4)	36.2 (12.0)	46.2 (16.4)	35.5 (12.8)	36.8 (12.7)	42.5 (16.7)
MENTAL HEALTH																
MENTAL DISORDERS	Major Depressive Disorder %	10.5	10.4	27.3	9.3	10.9	28.0	--	--	--	9.1	9.2	24.3	13.9	11.0	29.4
	Generalized Anxiety %	9.0	9.4	25.6	3.9	4.2	18.0	--	--	--	11.8	13.2	40.5	13.5	12.8	20.6
	Panic Attacks &/or Agoraphobia %	6.6	7.7	14.0	6.4	7.5	14.0	--	--	--	7.7	8.3	18.9	5.8	7.3	8.8
	Specific Phobias %	9.8	11.7	25.1	11.5	13.9	30.0	--	--	--	8.9	9.7	20.0	8.2	10.6	23.5
	Social Phobias %	3.5	3.6	10.0	3.9	3.5	16.0	--	--	--	4.6	3.8	11.1	1.9	3.7	0
	Obsessive Compulsive Disorder %	3.4	3.7	13.2	3.2	5.0	20.0	--	--	--	4.1	3.6	8.1	2.9	2.0	8.8
	Any Above CIDI Diagnosis %	29.0	33.4	45.1	27.9	29.9	60.0	--	--	--	29.4	29.9	48.7	30.3	41.2	19.1
	Attention Deficit Hyperactivity %	13.1	7.9	29.7	--	--	--	--	--	--	13.1	7.9	29.7	--	--	--

[59] Different scoring system used in Assessment 1

p < .05 (2 tail)   p < .01 (2 tail)

Category		Measure	Average Data NGs n=240	Average Data NPGs n=846	Average Data PGs n=42	Assessment 1 NGs n=312	Assessment 1 NPGs n=1010	Assessment 1 PGs n=50	Assessment 2 NGs n=217	Assessment 2 NPGs n=881	Assessment 2 PGs n=47	Assessment 3 NGs n=221	Assessment 3 NPGs n=726	Assessment 3 PGs n=37	Assessment 4 NGs n=208	Assessment 4 NPGs n=767	Assessment 4 PGs n=34
Eating Disorders		Adult Eating Disorder Scale M (SD) (Range: 0-5)	0.4 (0.8)	0.3 (0.7)	0.9 (1.3)	--	--	--	--	--	--	0.4 (0.8)	0.3 (0.7)	0.9 (1.3)	--	--	--
		Anorexia or Bulimia %	10.0	7.9	24.3	--	--	--	--	--	--	10.0	7.9	24.3	--	--	--
PAI Clinical Scales Raw Scores M (SD)		Somatic Complaints	11.1 (9.9)	11.5 (9.7)	17.9 (12.0)	11.4 (9.9)	11.5 (9.6)	17.5 (11.3)	11.2 (10.5)	11.8 (10.1)	17.7 (12.1)	--	--	--	10.4 (9.1)	11.0 (9.3)	18.7 (13.0)
		Anxiety	15.0 (10.6)	14.8 (9.8)	21.7 (11.6)	15.6 (10.7)	15.3 (9.8)	23.6 (10.5)	15.4 (10.3)	15.2 (10.2)	21.7 (12.0)	--	--	--	13.7 (10.8)	13.5 (9.3)	18.9 (12.6)
		Anxiety Related Disorders	17.5 (8.5)	17.1 (7.7)	22.7 (9.3)	18.6 (8.6)	17.8 (7.7)	24.2 (9.3)	17.9 (8.6)	17.8 (8.0)	23.2 (9.4)	--	--	--	15.3 (8.4)	15.3 (7.5)	19.7 (9.2)
		Depression	13.9 (9.8)	14.0 (9.4)	21.1 (12.0)	14.1 (9.6)	13.7 (9.1)	22.2 (11.7)	13.6 (9.6)	14.5 (9.9)	20.8 (12.8)	--	--	--	14.0 (10.4)	13.7 (9.3)	19.9 (11.4)
		Mania	22.7 (9.0)	22.9 (8.9)	25.0 (8.5)	24.1 (9.2)	24.5 (9.3)	27.3 (9.8)	23.6 (9.2)	23.4 (8.9)	24.1 (7.6)	--	--	--	19.5 (8.5)	20.1 (8.5)	23.0 (7.9)
		Paranoia	11.6 (6.6)	11.5 (6.1)	14.1 (6.4)	17.4 (8.5)	17.8 (8.3)	24.8 (9.0)	7.7 (5.6)	7.8 (4.9)	5.3 (4.4)	--	--	--	6.8 (4.7)	7.5 (4.7)	10.5 (5.2)
		Schizophrenia	8.8 (5.9)	8.2 (12.0)	12.0 (6.6)	14.4 (8.4)	13.8 (7.3)	20.0 (9.1)	5.2 (4.4)	5.3 (4.4)	7.7 (5.0)	--	--	--	4.0 (3.7)	4.0 (3.7)	6.1 (5.2)
		Borderline Features	16.7 (10.5)	17.6 (10.2)	25.7 (10.4)	18.1 (10.7)	18.8 (10.5)	29.8 (10.3)	16.9 (11.1)	17.9 (10.4)	23.9 (10.5)	--	--	--	14.3 (9.7)	15.6 (9.4)	22.2 (10.5)
		Aggression	12.4 (8.7)	14.0 (9.1)	19.4 (10.7)	11.5 (8.0)	13.5 (8.4)	18.1 (8.8)	13.7 (9.6)	14.5 (9.9)	20.8 (12.8)	--	--	--	--	--	--
		Suicidal Ideation	3.5 (5.1)	3.4 (4.9)	6.8 (6.7)	3.7 (5.3)	3.5 (4.8)	8.2 (7.5)	3.6 (5.2)	3.6 (5.3)	6.4 (6.7)	--	--	--	3.0 (4.7)	3.0 (4.4)	5.1 (5.4)
SUBSTANCE USE, ABUSE, AND DEPENDENCE		Tobacco user %	16.1	26.1	59.5	18.3	30.4	78.0	15.7	24.7	48.9	13.6	22.3	51.4	16.0	25.2	55.6
		Level of alcohol use M SD (Range 0 – 4; 0 = never)	2.09 (1.1)	2.65 (.70)	2.72 (.63)	2.06 (1.09)	2.64 (.69)	2.76 (.63)	2.06 (1.06)	2.59 (.75)	2.60 (.68)	2.30 (1.15)	2.80 (.65)	2.86 (.48)	1.95 (1.14)	2.57 (.72)	2.67 (.74)
		Illicit drug use %	18.3	25.1	34.5	20.2	29.7	52.0	19.4	24.3	25.5	18.6	22.7	27.0	13.9	22.2	29.4
		Alcohol dependence %	8.9	7.7	15.5	13.5	10.3	16.0	missing data	missing data	missing data	missing data	missing data	missing data	1.9	4.4	14.7
		Drug dependence (Illicit drugs; non-medical use of licit drugs) %	2.2	2.2	7.0	2.2	3.4	10.0	3.1	1.9	9.8	2.5	1.8	3.1	1.0	1.8	2.9
SOCIAL FUNCTIONING																		
		Heterosexual %	95.5	94.4	95.6	96.2	93.5	100.0	96.3	94.0	90.2	93.5	96.8	93.9	95.7	93.7	100.0
SOCIAL FUNCTIONING AND SUPPORT		Marital satisfaction %	82.3	76.3	67.4	86.9	83.0	82.4	82.9	77.2	56.0	75.6	69.9	58.8	82.1	72.3	70.6
		PAI Social Non-Support raw score M (SD)	6.5 (3.3)	6.2 (2.8)	8.5 (4.0)	6.5 (3.3)	6.2 (2.8)	8.5 (4.0)	--	--	--	--	--	--	--	--	--
		Family Environment Scale M (SD) (Range: 22-76)	55.1 (8.6)	54.1 (8.2)	53.4 (8.6)	55.1 (8.6)	54.0 (7.9)	52.3 (9.4)	55.0 (8.3)	54.2 (8.2)	53.5 (9.0)	54.3 (8.6)	53.8 (8.3)	54.3 (7.1)	55.9 (8.3)	54.4 (8.3)	53.8 (8.6)
		Neighbourhood Cohesion Index M (SD) (Range: 2-10; higher scores = decreased cohesion)	5.3 (2.0)	5.4 (2.0)	5.9 (1.9)	5.3 (1.9)	5.4 (2.0)	6.2 (2.0)	5.6 (2.2)	5.5 (2.0)	5.9 (2.0)	5.1 (2.0)	5.2 (2.0)	5.9 (1.8)	5.4 (1.9)	5.3 (1.9)	5.4 (1.6)
		Social Networks Scale M (SD) (Range: 0-50; higher scores indicate decreased risk for isolation)	32.5 (7.3)	31.8 (6.7)	29.2 (5.6)	32.7 (7.4)	32.6 (6.3)	29.3 (8.7)	31.9 (7.0)	30.8 (6.8)	28.5 (7.8)	32.6 (7.6)	32.1 (7.0)	30.1 (7.2)	32.8 (7.0)	31.7 (7.0)	29.1 (7.0)
RELIGION	Religious affiliation	Catholic %	11.2	21.4	33.7	9.8	22.2	34.0	10.9	21.3	30.4	10.6	21.4	36.1	14.4	20.6	35.3
		Protestant %	29.7	30.1	22.6	29.3	28.5	14.9	29.9	30.5	23.9	31.7	30.5	22.2	27.9	31.5	32.4
		No religion %	22.2	27.2	21.5	23.1	27.9	25.5	21.8	27.8	15.2	22.5	26.8	16.7	20.9	26.1	29.4

p < .05 (2 tail)	*p* < .01 (2 tail)		Average Data			Assessment 1			Assessment 2			Assessment 3			Assessment 4		
			NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs	NGs	NPGs	PGs
			n=240	*n*=846	*n*=42	*n*=312	*n*=1010	*n*=50	*n*=217	*n*=881	*n*=47	*n*=221	*n*=726	*n*=37	*n*=208	*n*=767	*n*=34
		Other religion %	36.9	21.2	22.2	37.8	21.4	25.5	37.4	20.3	30.4	35.3	21.3	25.0	36.8	21.8	2.9
		Religiosity Scale *M (SD)* (Range: 0-26; higher scores indicate greater belief)	15.7 (8.9)	12.3 (7.4)	12.2 (6.6)	15.9 (8.4)	12.6 (7.2)	11.2 (6.2)	--	--	--	15.7 (9.1)	12.2 (7.4)	13.7 (6.7)	15.5 (9.3)	12.1 (7.6)	12.2 (7.2)
ILLEGAL BEHAVIOUR AND ANTISOCIALITY		Illegal activities in lifetime %	5.0	0.4	13.1	Only 2 values	0	15.6	22.2	0.6	13.3	0	0.7	10.8	0	0.5	11.8
		PAI Antisocial Features raw scores *M (SD)*	12.6 (8.7)	14.1 (9.2)	20.3 (11.6)	14.2 (9.2)	16.7 (10.5)	25.3 (13.6)	12.7 (8.8)	13.6 (9.0)	17.4 (10.1)	--	--	--	10.1 (7.8)	11.4 (7.7)	16.8 (10.7)
COGNITIVE FUNCTIONING																		
Wechsler Abbreviated Scale of Intelligence		IQ *M (SD)*	111.9 (12.6)	110.3 (12.2)	101.8 (14.5)	111.9 (12.7)	109.3 (12.4)	99.9 (14.5)	110.9 (12.9)	110.7 (12.1)	103.4 (14.4)	112.1 (12.0)	110.9 (12.3)	103.2 (14.2)	112.6 (12.6)	110.7 (11.9)	100.8 (15.1)
		Above average %	58.9	51.8	18.0	58.9	51.8	18.0	--	--	--	--	--	--	--	--	--
		Average %	34.9	41.6	62.0	34.9	41.6	62.0	--	--	--	--	--	--	--	--	--
		Below average %	6.1	6.6	20.0	6.1	6.6	20.0	--	--	--	--	--	--	--	--	--
Wisconsin Card Sorting Task (> 16th percentile)		Total Errors %	76.3	79.6	66.0	76.3	79.6	66.0	--	--	--	--	--	--	--	--	--
		Perseverative Response %	86.2	84.2	84.0	86.2	84.2	84.0	--	--	--	--	--	--	--	--	--
		Perseverative Errors %	83.3	83.4	78.0	83.3	83.4	78.0	--	--	--	--	--	--	--	--	--
		Non-Perseverative Errors %	76.6	75.8	56.0	76.6	75.8	56.0	--	--	--	--	--	--	--	--	--

Appendix H: Independent Variable Profile of People who Became PPGM Problem Gamblers (PG) in the Next Assessment (A) for the First Time versus People who Stayed Non-Problem Gamblers (NPG) in the Next Assessment in QLS

p < .05 (2 tail); p < .01 (2 tail)		Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile		Assessment 4 IV Profile	
		Became PG next A	Stayed NPG next A	Became PG in A2	Stayed NPG in A2	Became PG in A3	Stayed NPG in A3	Became PG in A4	Stayed NPG in A4	Became PG in A5	Stayed NPG in A5
		n = 41	n = 3731	n = 55	n = 3826	n = 40	n = 3741	n = 27	n = 3700	n = 12	n = 3657
DEMOGRAPHICS											
Male %		43.3	44.7	40.0	45.1	45.0	44.7	44.4	44.7	50.0	44.4
Age M (SD) (Baseline range[60]: 17.3-89.5)		47.1 (13.5)	48.2 (13.9)	45.1 (12.3)	46.7 (14.0)	47.5 (15.4)	47.7 (13.9)	47.7 (13.8)	48.7 (13.9)	53.1 (12.3)	49.6 (13.9)
Immigrant %		6.7	7.7	12.7	7.7	5.0	7.7	0	7.6	0	7.8
Ethnicity	Aboriginal %	3.7	4.4	3.6	4.4	2.5	4.3	7.4	4.3	0.0	4.4
	African %	0.8	0.2	0.0	0.3	2.5	0.2	0.0	0.2	0.0	0.2
	Asian %	0.8	0.6	0.0	0.7	2.5	0.6	0.0	0.6	0.0	0.5
	European %	79.9	87.4	81.9	87.3	80.0	87.4	77.8	87.5	75.0	87.4
	Other %	14.9	7.4	14.5	7.2	12.5	7.4	14.8	7.4	25.0	7.4
Non-Caucasian		20.2	12.6	18.2	12.6	20.0	12.6	22.2	12.5	25.0	12.6
Adopted %		3.0	3.4	1.8	3.3	7.5	3.7	0	3.4	0	3.3
Raised by biological parents %		82.9	82.3	87.3	82.1	72.5	82.4	81.5	82.4	100.0	82.3
Educational Attainment	≤ Elementary school %	.7	1.1	1.8	1.1	0	1.0	0	1.1	0	1.0
	≤ Technical college %	71.0	55.9	72.7	55.9	70.0	55.9	63.0	56.0	83.3	56.0
	Completed college/university%	28.4	43.0	25.5	43.0	30.0	43.1	37.0	42.9	16.7	43.0
Marital Status	Never married %	15.7	10.3	12.7	11.5	27.5	10.1	11.1	9.8	0.0	9.6
	Married %	53.0	60.4	58.2	59.1	37.5	60.5	66.7	60.8	50.0	61.3
	Living common-law %	8.2	12.2	10.9	13.0	5.0	12.6	3.7	12.1	16.7	11.1
	Separated %	8.2	5.2	5.5	4.9	15.0	5.4	7.4	5.3	0.0	5.3
	Divorced %	11.2	7.9	9.1	7.7	12.5	7.4	11.1	7.8	16.7	8.5
	Widowed %	3.7	4.0	3.6	3.8	2.5	3.9	0.0	4.2	16.7	4.2
Employment Status	Unemployed %	3.7	4.9	1.8	4.5	5.0	4.8	0.0	5.0	16.7	5.1
	Retired %	16.4	19.2	14.5	18.2	15.0	19.3	25.9	19.8	8.3	19.4
	Homemaker %	6.7	4.8	9.1	5.6	7.5	4.7	0.0	4.9	8.3	3.8
	Full-time Student %	2.3	2.0	5.5	2.1	0.0	2.2	0.0	1.8	0.0	1.8
	On leave/strike %	9.0	5.2	7.3	5.2	10.0	5.1	11.1	5.4	8.3	5.2
	Employed part-time %	9.7	12.8	12.7	11.9	10.0	12.2	3.7	12.5	8.3	14.7
	Employed full-time %	52.3	51.2	49.1	52.6	52.5	51.7	59.3	50.5	50.0	50.0
Household Income	< $30,000 %	19.4	21.0	16.4	20.8	30.0	21.6	14.8	20.7	8.3	20.9
	$30,000-$49,999 %	32.8	22.7	30.9	23.7	45.0	24.0	14.8	21.8	41.7	21.2
	$50,000-$89,999 %	35.8	36.0	40.0	37.7	20.0	34.6	48.1	36.4	41.7	35.3
	> $90,000 %	11.9	20.3	12.7	17.8	5.0	19.8	22.2	21.1	8.3	22.5
Household debt M (SD) (Range: 1 - 43; 18 = $35,000)		17.9 (10.1)	18.0 (10.8)	19.0 (10.3)	17.8 (10.5)	14.9 (10.3)	18.1 (10.7)	20.4 (9.4)	18.0 (10.9)	17.3 (10.0)	18.2 (11.0)

---

[60] Depending on the variable, range either represents observed minimum and maximum values or *potential* minimum and maximum values.

		Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile		Assessment 4 IV Profile	
p < .05 (2 tail); *p* < .01 (2 tail)		Became PG next A	Stayed NPG next A	Became PG in A2	Stayed NPG in A2	Became PG in A3	Stayed NPG in A3	Became PG in A4	Stayed NPG in A4	Became PG in A5	Stayed NPG in A5
		n = 41	*n* = 3731	*n* = 55	*n* = 3826	*n* = 40	*n* = 3741	*n* = 27	*n* = 3700	*n* = 12	*n* = 3657
PHYSICAL HEALTH											
PHYSICAL FUNCTIONALITY	Disability or chronic health concern %	20.2	15.8	18.2	14.3	22.5	15.9	14.8	16.3	33.3	16.6
HEALTH STATUS	Physical health rating *M* (*SD*) (Range: 1 - 6; 6 = excellent)	4.46 (1.05)	4.57 (0.98)	4.53 (1.09)	4.74 (0.97)	4.30 (1.11)	4.57 (0.99)	4.78 (0.80)	4.53 (0.99)	3.92 (1.24)	4.45 (0.99)
	Currently taking Rx medication %	50.8	49.4	49.1	47.5	42.5	49.2	51.9	49.1	83.3	51.7
GAMBLING											
GAMBLING ATTITUDES	Gambling Attitudes Measure *M* (*SD*) (Range: -4 to +4)	1.35 (1.57)	0.98 (1.67)	1.49 (1.62)	1.07 (1.70)	1.15 (1.64)	0.93 (1.68)	1.48 (1.53)	0.97 (1.66)	1.08 (1.24)	0.96 (1.65)
LIFETIME GAMBLING	Age first gambled *M* (*SD*) (Range: 3 - 75)	20.5 (8.6)	20.9 (7.9)	21.02 (8.78)	20.87 (8.72)	21.3 (9.8)	20.9 (8.7)	18.4 (7.8)	20.9 (8.7)	20.3 (5.5)	20.9 (8.6)
	Gambling frequency prior to 19 *M* (*SD*) (Range: 0-3; never to regularly)	1.0 (.9)	.8 (.9)	0.88 (0.87)	0.81 (0.86)	1.1 (.9)	.8 (.9)	1.2 (1.0)	.8 (.9)	.9 (.9)	.8 (.9)
	Big gambling wins or loss prior to 19 — Big win %	5.2	3.3	7.3	3.3	5.0	3.2	0	3.4	8.3	3.3
	Big loss %	0	0.5	0.0	0.5	0	0.5	0	0.5	0	0.5
	Big win & big loss %	3.71	1.45	3.6	1.5	2.5	1.5	3.7	1.4	8.3	1.4
	Parents or sibs regular gamblers when person was growing up %	29.8	19.5	23.6	19.5	30.0	19.5	37.0	19.5	41.7	19.6
	Parents or sibs occasionally or regularly gambled with person when growing up %	20.15	11.05	18.2	11.0	17.5	11.1	33.3	11.0	8.3	11.1
	Parents or sibs problem gamblers when person was growing up %	6.8	2.2	3.6	2.1	2.5	2.2	14.8	2.1	16.7	2.2
	Largest single day loss ever ($) *M* (*SD*)	1720 (5183)	610 (7990)	1473 (4252.91)	500 (4163.71)	2941 (9944)	697 (13697)	1059 (2213)	725 (13814)	273 (265)	520 (4304)
	Median	266	60	300	60	265	60	250	60	150	60
	Largest single day win ever ($) *M* (*SD*)	4203 (10374)	3169 (42889)	2615 (3582)	3530 (61054)	5906 (13462)	3516 (61707)	6172 (23727)	2784 (46316)	1377 (1168)	2824 (46645)
	Median	939	200	1000	200	825	200	800	200	1350	200
	Lifetime estimate of net win/loss ($) *M* (*SD*)	-6630 (32492)	-572 (36581)	-5159 (33463)	-213 (46216)	-8662 (41070)	-69 (46432)	-2457 (18814)	-955 (22945)	-15992 (30220)	-1073 (23175)
	Median	-1000	-300	-1000	-300	-700	-300	-1000	-300	-2000	-300
PAST YEAR GAMBLING — Frequency of gambling (days per typical month) *M (SD)* — 0.0 = not at all / 0.5 = < 1/month / 1.0 = 1/month / 2.5 = 2-3/month / 4.0 = 1/week / 10 = 2-3/week / 20 = ≥ 4/week	Lottery tickets	4.48 (5.11)	2.96 (3.70)	4.80 (5.22)	3.35 (3.76)	3.45 (4.39)	2.97 (3.71)	4.56 (4.99)	2.87 (3.76)	6.29 (7.23)	2.62 (3.56)
	Instant win tickets	3.08 (4.56)	1.39 (2.79)	3.16 (4.56)	1.81 (3.01)	3.12 (4.15)	1.33 (2.71)	2.41 (4.46)	1.28 (2.79)	4.04 (6.17)	1.13 (2.65)
	Bingo	0.77 (2.09)	0.23 (1.13)	1.35 (3.30)	0.31 (1.11)	0.38 (1.58)	0.24 (1.20)	0.43 (1.15)	0.19 (1.08)	0.13 (0.31)	0.19 (1.12)
	EGMs	1.27 (2.30)	0.43 (1.24)	1.49 (2.97)	0.59 (1.14)	1.03 (1.80)	0.41 (1.33)	0.76 (1.07)	0.37 (1.30)	2.21 (3.70)	0.33 (1.19)
	Casino table games	0.56 (2.17)	0.14 (0.98)	0.63 (2.74)	0.11 (0.66)	0.31 (0.68)	0.18 (1.22)	0.89 (3.85)	0.14 (1.07)	0.29 (0.72)	0.13 (0.97)
	Games of skill for money	1.46 (3.96)	0.54 (2.12)	1.62 (4.70)	0.55 (2.07)	1.04 (2.33)	0.59 (2.24)	1.13 (3.92)	0.49 (1.91)	2.92 (6.14)	0.54 (2.25)

			Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile		Assessment 4 IV Profile	
p < .05 (2 tail); p < .01 (2 tail)			Became PG next A	Stayed NPG next A	Became PG in A2	Stayed NPG in A2	Became PG in A3	Stayed NPG in A3	Became PG in A4	Stayed NPG in A4	Became PG in A5	Stayed NPG in A5
			n = 41	*n = 3731*	*n = 55*	*n = 3826*	*n = 40*	*n = 3741*	*n = 27*	*n = 3700*	*n = 12*	*n = 3657*
PAST YEAR GAMBLING	(means & medians calculated for entire group, including individuals who did not engage in the format)	Sporting events	0.95 (3.02)	0.33 (1.63)	0.99 (3.29)	0.34 (1.62)	0.96 (3.53)	0.34 (1.64)	0.22 (0.53)	0.34 (1.71)	2.33 (5.71)	0.30 (1.54)
		Horse or dog racing	0.21 (0.78)	0.08 (0.54)	0.14 (0.56)	0.13 (0.84)	0.08 (0.21)	0.06 (0.38)	0.48 (1.92)	0.06 (0.50)	0.38 (1.15)	0.05 (0.41)
		High risk stocks	0.27 (1.22)	0.06 (0.60)	0.09 (0.36)	0.06 (0.70)	0.13 (0.64)	0.05 (0.48)	0.80 (3.84)	0.06 (0.68)	0.33 (1.15)	0.05 (0.53)
		Other forms of gambling	0.13 (0.66)	0.10 (1.00)	0.28 (1.44)	0.12 (1.10)	0.00 (0.00)	0.10 (1.00)	0.00 (0.00)	0.07 (0.87)	0.21 (0.72)	0.09 (1.01)
	Frequency of all forms combined *M* (*SD*) (Range: 0-30; capped at 30)		11.77 (9.20)	5.98 (6.68)	12.89 (9.99)	7.13 (6.90)	9.86 (8.37)	5.98 (6.78)	10.83 (8.32)	5.56 (6.62)	15.17 (10.31)	5.19 (6.42)
	Gambled on Internet %		14.9	4.2	21.8	4.4	15.0	4.4	7.4	4.2	0.0	3.7
	# of different forms in past year *M* (*SD*) (Range: 0-10)		3.96 (1.60)	2.73 (1.64)	4.27 (1.62)	2.98 (1.73)	3.88 (1.36)	2.91 (1.70)	3.37 (1.78)	2.57 (1.57)	4.08 (1.88)	2.43 (1.55)
	Gambling Expenditure $ (net win/loss in typical month) *M (SD)* (means and medians calculated for entire group, including individuals who did not engage in the format)	Lottery tickets	-108.12 (665.00)	-211.69 (17849.70)	-59.92 (159.46)	-17.46 (91.53)	-335.63 (1337.40)	-34.27 (1205.96)	97.78 (982.50)	-69.76 (1325.22)	-34.00 (26.42)	-739.96 (70170.89)
		Median	-17.66	-7.27	-20.00	-8.00	-15.00	-10.00	-10.00	-6.00	-33.00	-5.00
		Instant win tickets	-223.61 (1311.13)	-286.58 (16546.98)	-17.14 (54.49)	-6.74 (40.31)	-657.03 (4109.87)	-14.97 (196.78)	-92.52 (294.40)	-43.20 (1096.43)	-20.25 (29.58)	-1103.39 (66172.14)
		Median	-8.62	-1.01	-10.00	-2.00	-9.50	-2.00	-5.00	0.00	-7.50	0.00
		Bingo	-6.87 (49.53)	-7.12 (102.68)	-10.18 (78.58)	-6.31 (74.55)	-1.13 (36.08)	-8.11 (71.76)	-10.37 (28.49)	-6.07 (108.97)	-2.92 (8.65)	-8.01 (157.38)
		Median	0.00	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00
		EGMs	-38.86 (175.12)	-442.28 (25069.09)	-22.55 (205.98)	-17.44 (103.91)	-41.13 (187.11)	-91.14 (2366.44)	-50.74 (96.44)	-25.88 (494.50)	-79.33 (170.77)	-1667.21 (99272.17)
		Median	-20.15	0.00	-20.00	0.00	-32.50	0.00	0.00	0.00	-25.00	0.00
		Casino table games	-16.27 (71.14)	-7.24 (189.36)	-3.55 (49.21)	-4.90 (77.32)	-34.13 (129.80)	-13.87 (259.22)	-13.70 (42.89)	-7.06 (187.11)	-20.83 (39.65)	-3.10 (237.38)
		Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Games of skill for money	-10.29 (61.22)	-6.92 (190.57)	-12.51 (96.80)	-2.69 (55.10)	-12.08 (53.18)	-12.17 (275.20)	-3.63 (19.29)	-10.81 (238.44)	-9.17 (19.29)	-2.03 (197.29)
		Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Sports betting	-132.79 (831.73)	-3.04 (162.63)	-5.27 (64.04)	-1.84 (21.23)	-432.43 (2686.92)	-7.27 (130.99)	-0.81 (3.37)	-1.34 (464.83)	-15.42 (30.41)	-1.68 (37.15)
		Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Horse or dog racing	-2.03 (22.25)	-3.35 (73.46)	-2.54 (27.67)	-2.53 (27.68)	2.18 (16.58)	-7.28 (190.02)	-4.81 (21.19)	-2.10 (56.30)	-7.50 (18.65)	-1.45 (19.49)
		Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		High risk stocks	147.90 (1134.82)	-40.81 (4231.65)	10.00 (412.02)	83.60 (3271.66)	500.00 (3164.30)	14.68 (1219.40)	-25.19 (98.70)	-166.86 (4927.17)	-4.17 (14.43)	-100.22 (7613.28)
		Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Other forms of gambling	-7.06 (35.08)	-8.17 (784.25)	-8.11 (53.96)	-34.86 (2267.42)	0.00 (0.00)	6.56 (668.63)	0.00 (0.00)	-0.72 (10.28)	-41.67 (144.34)	-2.87 (133.77)
	Expenditure on all forms combined *M (SD)*		-397.27 (3014.03)	-370.27 (2584.58)	-129.98 (586.28)	-11.16 (3988.15)	-1011.35 (8608.25)	-167.82 (3586.46)	-104.00 (927.18)	-333.79 (5281.13)	-235.25 (190.10)	-4007.08 (231760)
	Median		-127.92	-19.28	-147.00	-20.00	-90.50	-23.00	-100.00	-19.00	-228.00	-15.00

		Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile		Assessment 4 IV Profile	
p < .05 (2 tail); p < .01 (2 tail)		Became PG next A	Stayed NPG next A	Became PG in A2	Stayed NPG in A2	Became PG in A3	Stayed NPG in A3	Became PG in A4	Stayed NPG in A4	Became PG in A5	Stayed NPG in A5
		n = 41	n = 3731	n = 55	n = 3826	n = 40	n = 3741	n = 27	n = 3700	n = 12	n = 3657
	Expenditure on all forms combined category (Range 0-16)	3.9 (3.7)	1.7 (3.0)	3.8 (3.6)	1.6 (2.1)	4.2 (4.0)	1.8 (2.4)	3.2 (3.2)	1.8 (2.9)	5.2 (4.5)	1.6 (2.4)
	Largest single day loss M (SD)	588.76 (2573.07)	132.35 (2181.35)	260.35 (391.49)	88.35 (460.59)	1420.88 (7879.94)	126.92 (1112.51)	186.48 (220.31)	227.97 (6642.07)	225.50 (176.91)	87.17 (561.73)
	Median	127.29	15.07	100.00	20.00	150.00	20.00	100.00	10.00	238.00	10.00
	Largest single day loss category (Range 0 - 7)	1.6 (1.1)	.9 (.9)	1.6 (1.1)	.9 (.8)	1.6 (1.2)	.9 (.8)	1.6 (1.1)	.8 (.9)	1.8 (1.2)	.8 (.8)
	Largest single day win ($) M (SD)	2696.57 (12853.15)	838.12 (24860.57)	1097.36 (2151.30)	570.18 (16208.16)	6996.98 (39428.18)	672.6 (10540)	461.30 (678.39)	438.58 (3860.18)	721.67 (717.05)	1692.14 (69810.51)
	Median	324.64	15.07	320.00	20.00	332.50	20.00	200.00	10.00	600.00	10.00
	Largest single day win category (Range 0 - 7)	2.5 (1.8)	1.1 (1.4)	2.5 (1.9)	1.2 (1.3)	2.6 (1.9)	1.2 (1.4)	2.4 (1.7)	1.1 (1.3)	2.6 (1.7)	1.0 (1.3)
	Member of gambling rewards program %	50.5	24.0	--	--	57.5	22.6	44.0	24.2	41.7	25.2
	Frequency of ATM use in gambling venues M (SD) (Range: 0-4)	1.38 (1.04)	0.74 (0.96)	--	--	1.41 (1.26)	0.76 (0.98)	1.18 (0.80)	0.75 (0.95)	1.70 (0.82)	0.71 (0.95)
GAMBLING MOTIVATION	Excitement/entertainment/fun %	70.9	62.1	75.5	65.9	70.0	63.1	72.0	60.1	50.0	58.9
	Win money %	39.1	30.7	34.0	30.7	50.0	31.6	32.0	30.6	41.7	29.7
	Escape/distraction %	12.2	4.2	11.3	3.9	12.5	5.1	8.0	3.6	25.0	4.0
	Socialize %	18.4	14.4	18.9	13.6	17.5	16.2	16.0	13.7	25.0	13.9
	Support worthy causes %	6.2	8.9	7.5	9.4	5.0	10.0	8.0	8.3	0.0	7.9
	To feel good about self %	1.0	1.2	1.9	0.8	0.6	2.6	0.0	0.7	0.0	0.5
	Other reason %	1.6	3.9	0.0	3.4	2.5	3.9	4.0	4.0	0.0	4.3
GAMBLING CONTEXT	Alone or with friends M (SD) (Range: 1-5; 1 = always alone)	3.59 (1.39)	4.18 (1.22)	3.68 (1.28)	4.24 (1.15)	3.53 (1.45)	4.20 (1.21)	3.64 (1.35)	4.14 (1.26)	3.30 (1.83)	4.15 (1.28)
	Drink alcohol when gambling M (SD) (Range: 0-4; never to always)	0.78 (1.20)	0.91 (1.13)	0.84 (1.28)	0.95 (1.12)	0.58 (1.03)	0.96 (1.15)	1.00 (1.35)	0.90 (1.12)	0.70 (1.06)	0.83 (1.12)
	Smoke/use tobacco when gambling M (SD) (Range: 0-4)	1.37 (1.68)	0.87 (1.42)	1.42 (1.67)	0.95 (1.48)	1.40 (1.69)	0.90 (1.43)	1.48 (1.81)	0.81 (1.38)	0.80 (1.40)	0.80 (1.38)
	Use [street] drugs when gambling M (SD) (Range: 0-4)	0.13 (0.50)	0.08 (0.42)	0.12 (0.52)	0.09 (0.45)	0.16 (0.49)	0.08 (0.41)	0.08 (0.40)	0.08 (0.41)	0.20 (0.63)	0.08 (0.42)
GAMBLING SOCIAL EXPOSURE	# of close friends & family who are regular gamblers M (SD) (Range: 0-4)	1.82 (0.77)	1.36 (0.97)	1.62 (0.95)	1.35 (0.99)	1.88 (0.73)	1.38 (0.96)	1.92 (0.57)	1.38 (0.96)	2.30 (0.48)	1.34 (0.97)
	# of close friends and family with gambling problems M (SD) (Range: 0-4)	0.40 (0.69)	0.20 (0.52)	0.48 (0.83)	0.21 (0.52)	0.14 (0.42)	0.21 (0.52)	0.52 (0.67)	0.19 (0.50)	0.67 (1.00)	0.20 (0.53)
	Other adults in household with gambling problems M (SD) (Range: 0-5)	0.05 (0.20)	0.02 (0.17)	0.04 (0.19)	0.02 (0.16)	0.05 (0.22)	0.02 (0.18)	0.08 (0.27)	0.02 (0.18)	0.00 (0.00)	0.02 (0.17)
	Opportunity to gamble at workplace or school M (SD) (Range: 0-3)	0.35 (0.73)	0.48 (0.85)	0.58 (0.93)	0.54 (0.90)	0.21 (0.73)	0.49 (0.87)	0.16 (0.38)	0.46 (0.83)	0.20 (0.63)	0.41 (0.80)
	Exposed to prevention or awareness campaigns at workplace (or school) %	4.5	4.9	9.1	5.6	2.5	4.2	0.0	4.7	0.0	5.0
GAMBLING FALLACIES	Gambling Fallacies Measure M (SD) (Range: 0-10: 10 = no fallacies)	6.57 (1.68)	7.11 (1.39)	6.35 (1.69)	6.92 (1.47)	6.93 (1.54)	7.16 (1.37)	--	--	6.42 (2.11)	7.26 (1.33)
GAMBLING AVAILABILITY	Driving time (minutes) to nearest EGM venue M (SD) (Range: 0-188)	68.86 (19.64)	72.82 (19.11)	65.55 (21.81)	73.41 (18.12)	72.45 (18.31)	73.05 (18.74)	70.67 (14.33)	72.46 (19.43)	68.00 (26.06)	72.31 (20.18)

	Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile		Assessment 4 IV Profile	
p < .05 (2 tail); *p* < .01 (2 tail)	Became PG next A	Stayed NPG next A	Became PG in A2	Stayed NPG in A2	Became PG in A3	Stayed NPG in A3	Became PG in A4	Stayed NPG in A4	Became PG in A5	Stayed NPG in A5
	n = 41	*n* = 3731	*n* = 55	*n* = 3826	*n* = 40	*n* = 3741	*n* = 27	*n* = 3700	*n* = 12	*n* = 3657
Distance (km) to nearest EGM venue *M* (*SD*) (Range: 0-216)	86.77 (30.46)	91.45 (27.75)	80.85 (34.18)	92.60 (26.54)	93.02 (27.57)	91.92 (27.33)	90.19 (24.56)	90.92 (28.26)	85.40 (36.29)	90.31 (28.94)
Participant estimate of distance to nearest EGM venue *M* (*SD*) (Range: 1-10; 1 = 0-10 kms; 10 = >90 kms)	6.00 (2.86)	7.54 (2.60)	--	--	--	--	--	--	6.00 2.86	7.54 2.60
PERSONALITY										
Neuroticism	19.2 (7.1)	17.1 (7.0)	20.5 (7.9)	17.1 (7.3)	17.8 (6.3)	17.1 (7.4)	18.8 (7.2)	17.1 (7.4)	18.8 (5.9)	17.1 (7.3)
Depression	13.3 (5.0)	11.8 (5.2)	14.0 (5.4)	11.7 (5.4)	12.5 (4.9)	11.8 (5.4)	13.4 (4.8)	11.8 (5.4)	12.3 (4.4)	11.8 (5.4)
Vulnerability	9.7 (3.9)	9.0 (3.9)	10.1 (4.6)	9.0 (4.0)	9.0 (3.1)	9.0 (4.0)	9.5 (3.9)	9.0 (4.0)	10.8 (3.7)	9.0 (4.0)
Impulsivity	15.8 (3.5)	14.2 (4.0)	15.9 (3.4)	14.1 (4.3)	15.6 (3.5)	14.2 (4.3)	15.6 (4.0)	14.2 (4.3)	16.2 (2.9)	14.2 (4.3)
Extraversion	27.6 (4.9)	27.6 (4.9)	27.6 (5.0)	27.6 (4.8)	26.9 (5.1)	27.6 (4.8)	29.1 (4.2)	27.6 (4.8)	26.4 (5.1)	27.6 (4.8)
Excitement-seeking	18.0 (4.1)	17.5 (4.3)	18.2 (3.9)	17.5 (4.2)	17.9 (3.9)	17.5 (4.2)	18.4 (4.6)	17.5 (4.2)	16.5 (4.5)	17.6 (4.2)
Agreeableness	32.0 (5.8)	33.1 (5.1)	31.5 (6.3)	33.1 (5.3)	32.5 (5.4)	33.1 (5.3)	33.0 (5.8)	33.1 (5.3)	30.3 (4.3)	33.1 (5.3)
Conscientiousness	32.9 (5.1)	33.6 (5.7)	33.5 (5.0)	33.6 (5.1)	32.5 (5.2)	33.6 (5.0)	33.7 (4.1)	33.6 (5.1)	29.5 (7.5)	33.6 (5.0)
Openness	27.4 (6.3)	27.6 (5.5)	27.5 (6.8)	27.6 (5.7)	28.7 (6.2)	27.5 (5.7)	26.7 (6.0)	27.5 (5.7)	24.1 (5.0)	27.6 (5.7)
STRESS										
Number of stressful life events *M* (*SD*) (Range: 0-58)	3.61 (2.89)	2.54 (2.54)	4.76 (4.12)	3.23 (2.91)	2.65 (2.24)	2.49 (2.54)	2.44 (1.93)	2.27 (2.40)	1.92 (1.62)	2.14 (2.31)
Stress level *M* (*SD*) (Range: 1-7; higher scores = higher stress)	4.20 (1.08)	4.00 (1.22)	4.62 (1.16)	4.04 (1.20)	3.98 (1.17)	3.99 (1.22)	3.67 (1.00)	3.95 (1.23)	4.17 (0.58)	4.02 (1.24)
Happiness level *M* (*SD*) (Range: 1-7; higher scores = more happiness)	4.56 (1.02)	4.73 (1.00)	4.65 (1.04)	4.76 (0.97)	4.38 (1.13)	4.74 (0.98)	4.67 (0.88)	4.73 (1.03)	4.50 (0.91)	4.67 (1.02)
Life satisfaction *M* (*SD*) (Range: 1-7)	4.44 (0.98)	4.75 (1.04)	4.44 (0.83)	4.78 (1.04)	4.38 (1.10)	4.75 (1.02)	4.67 (1.07)	4.77 (1.07)	4.08 (1.08)	4.71 (1.04)
Personal Wellness Index *M* (*SD*) (Range: 0-70)	47.85 (11.58)	48.92 (11.55)	--	--	--	--	49.37 (10.53)	49.06 (11.55)	44.42 (13.94)	48.79 (11.56)
Abused as a child %	23.9	21.1	27.3	21.3	22.5	21.2	22.2	20.9	16.7	21.1
Prefer not to say whether abused %	6.0	5.5	3.6	5.5	7.5	5.5	11.1	5.4	0	5.4
Other past trauma that still has present day effect %	32.8	27.2	34.5	27.2	40.0	27.1	29.6	27.1	8.3	27.3
VALUES										
Money %	16.7	11.2	--	--	--	--	--	--	16.7	11.2
Power %	0.0	0.4	--	--	--	--	--	--	0.0	0.4
Fame %	0.0	0.1	--	--	--	--	--	--	0.0	0.1
Friendships %	75.0	67.3	--	--	--	--	--	--	75.0	67.3

Row section labels (left margin): PERSONALITY TRAITS NEO-FFI/NEO-PI-R Raw Scores *M* (*SD*); PERSONALITY TRAITS; PAST YEAR STRESS; WELL BEING; LIFETIME STRESS; Most important in life

		Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile		Assessment 4 IV Profile	
p < .05 (2 tail); *p* < .01 (2 tail)		Became PG next A	Stayed NPG next A	Became PG in A2	Stayed NPG in A2	Became PG in A3	Stayed NPG in A3	Became PG in A4	Stayed NPG in A4	Became PG in A5	Stayed NPG in A5
		n = 41	*n* = 3731	*n* = 55	*n* = 3826	*n* = 40	*n* = 3741	*n* = 27	*n* = 3700	*n* = 12	*n* = 3657
None of the above %		8.3	20.9	--	--	--	--	--	--	8.3	20.9
Wealth indicates success *M* (*SD*) (Range: 1-5: higher scores denote greater agreement)		2.83 (0.84)	3.24 (1.00)	--	--	--	--	--	--	2.83 (0.84)	3.24 (1.00)
MENTAL HEALTH											
MENTAL DISORDERS	Post-Traumatic Stress %	6.0	2.1	9.1	2.8	2.5	1.6	3.7	2.0	8.3	2.0
	Major Depressive Disorder %	26.1	12.0	25.5	13.1	27.5	11.9	29.6	11.6	16.7	11.3
	Manic Episode %	0.9	0.4	1.8	0.5	0.6	0.0	0.0	0.5	0.0	0.4
	Generalized Anxiety %	4.5	4.1	9.1	3.3	2.5	4.9	0.0	4.5	0.0	3.6
	Panic Attacks &/or Agoraphobia %	9.7	5.5	12.8	5.3	5.0	5.8	7.4	5.7	16.7	5.1
	Obsessive Compulsive Disorder %	2.3	0.8	5.5	0.9	0.0	0.8	0.0	0.8	0.0	0.7
	Bulimia %	3.7	0.9	7.3	0.8	0.0	1.0	3.7	0.9	0.0	0.7
	Schizophrenic or Delusional %	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
	Any mental health problem %	35.8	16.9	43.6	18.1	27.5	16.9	33.3	16.8	33.3	15.9
SUBSTANCE USE, ABUSE, AND DEPENDENCE	Tobacco user %	51.5	36.0	52.7	38.0	55.0	36.2	51.9	35.2	33.3	34.4
	Alcohol user %	76.3	74.2	70.9	76.7	80.0	75.2	85.2	73.2	68.2	71.6
	Illicit Drug user %	18.4	11.5	16.4	6.5	25.0	12.9	14.8	14.1	13.6	12.8
	> Weekly use of tobacco, alcohol, illicit drugs or nonmedical licit %	48.5	48.5	47.3	51.8	57.5	50.7	40.7	45.8	41.7	45.7
	Substance abuse or dependence %	17.2	5.9	21.8	7.0	10.0	6.6	22.2	5.2	8.3	5.0
BEHAVIOURAL ADDICTION (over-eating; sex or pornography; exercise; shopping; Internet chat lines; video/Internet gaming; other) %		11.19	4.60	10.9	4.6	12.5	5.0	7.4	4.9	16.7	4.3
LIFETIME MENTAL HEALTH (prior to past 12 months)	Lifetime personal history of addiction to drugs/alcohol %	8.2	6.9	7.3	6.9	5.0	7.0	7.4	6.9	25.0	6.9
	Lifetime personal history of behavioural addiction %	8.2	4.5	10.9	4.5	10.0	4.5	3.7	4.5	0	4.5
	Parents/siblings have history of addiction %	26.8	24.0	23.6	24.1	22.5	24.2	29.6	23.8	50.0	23.7
	Lifetime personal history of mental health problems %	9.7	12.4	10.9	12.3	10.0	12.4	3.7	12.4	16.7	12.3
	Parents/siblings have history of mental health problems %	11.2	12.4	12.7	12.5	7.5	12.4	14.8	12.3	8.3	12.4
SOCIAL FUNCTIONING											
SOCIAL FUNCTIONING AND SUPPORT	Heterosexual	91.8	96.1	90.9	96.1	92.5	96.1	88.9	96.3	100	96.0
	Marital Satisfaction Scale *M* (*SD*) (Range: 3-21; higher scores = greater satisfaction)	16.89 (3.76)	17.03 (4.00)	17.35 (3.06)	17.59 (3.68)	17.65 (3.28)	17.05 (3.97)	15.16 (5.95)	16.77 (4.17)	16.13 (3.68)	16.69 (4.21)
	PAI Social Non-Support Scale *M* (*SD*) (Range: 0-24; higher scores indicate low support)	4.81 (4.10)	4.03 (3.58)	4.60 (3.82)	4.07 (3.45)	4.65 (4.32)	3.88 (3.54)	5.37 (4.25)	4.07 (3.62)	5.08 (4.32)	4.09 (3.70)
	Family functioning *M* (*SD*) (Range: 1-7: higher scores denote higher functioning)	5.33 (1.33)	5.56 (1.21)	5.49 (1.14)	5.61 (1.21)	5.28 (1.32)	5.59 (1.21)	5.30 (1.66)	5.51 (1.21)	4.83 (1.47)	5.51 (1.21)

			Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile		Assessment 4 IV Profile	
$p < .05$ (2 tail); $p < .01$ (2 tail)			Became PG next A	Stayed NPG next A	Became PG in A2	Stayed NPG in A2	Became PG in A3	Stayed NPG in A3	Became PG in A4	Stayed NPG in A4	Became PG in A5	Stayed NPG in A5
			$n = 41$	$n = 3731$	$n = 55$	$n = 3826$	$n = 40$	$n = 3741$	$n = 27$	$n = 3700$	$n = 12$	$n = 3657$
COMMUNITY QUALITY AND INVOLVEMENT M (SD)(Range: 6-30; higher scores indicate greater involvement and quality)			20.67 (4.14)	21.01 (4.08)	20.25 (4.10)	21.13 (3.95)	21.10 (4.16)	21.05 (4.06)	21.52 (3.85)	20.92 (4.19)	19.25 (4.86)	20.92 (4.13)
RELIGION	Religious affiliation	Catholic %	24.6	21.4	27.3	21.1	15.0	21.4	33.3	21.3	25.0	21.6
		Protestant %	47.8	55.2	50.9	55.1	47.5	55.1	40.7	55.4	50.0	55.2
		Atheist %	5.2	3.8	1.8	3.9	10.0	3.7	3.7	3.7	8.3	3.7
		Agnostic %	6.7	4.1	3.6	4.2	7.5	4.1	7.4	4.1	16.7	4.1
		Other %	7.5	9.0	7.3	9.0	7.5	9.0	11.1	9.0	0	9.0
		No answer %	8.2	6.6	9.1	6.7	12.5	6.6	3.7	6.5	0	6.4
	Religiosity Scale M (SD) (Range: 0-26; higher scores indicate more belief/influence)		8.2 (6.3)	6.6 (5.5)	13.84 (6.86)	12.11 (6.95)	11.0 (6.7)	12.2 (6.9)	12.6 (7.5)	12.2 (6.9)	11.3 (7.6)	12.2 (6.9)
RECREATIONAL ACTIVITIES	Gambling is 1 of 5 favourite leisure activities %		29.9	9.3	38.2	15.2	27.5	6.3	18.5	8.2	24.9	7.3
	Gambling is person's favourite leisure activity %		3.0	1.0	5.5	1.6	0.0	0.4	3.7	0.9	0.0	1.0
OCCUPATIONAL FUNCTIONING	Job stress M (SD) (Range: 1-7; extremely low to extremely high)		4.20 (1.44)	4.18 (1.31)	4.12 (1.57)	4.17 (1.33)	3.91 (1.57)	4.17 (1.33)	4.63 (1.26)	4.17 (1.32)	4.57 (0.79)	4.20 (1.26)
	Job satisfaction M (SD) (Range: 1-7)		4.33 (1.08)	4.55 (1.19)	4.40 (1.19)	4.56 (1.20)	4.09 (1.15)	4.54 (1.20)	4.74 (0.81)	4.53 (1.21)	3.86 (0.90)	4.57 (1.15)
ILLEGAL BEHAVIOUR AND ANTISOCIALITY	# of Illegal activities in lifetime M (SD) (Range: 0-14)		.69 (1.2)	.75 (2.0)	0.82 (1.40)	0.73 (1.49)	.28 (.51)	.84 (1.5)	.56 (.85)	.72 (1.5)	1.8 (3.5)	.72 (1.5)
	# of Illegal activities in past year M (SD) (Range: 0-14)		0.09 (0.35)	0.05 (0.30)	0.15 (0.56)	0.10 (0.43)	0.05 (0.22)	0.04 (0.26)	0.07 (0.27)	0.03 (0.31)	0.00 (0.00)	0.03 (0.21)
	PAI Antisocial Features Raw Score M (SD)		12.5 (8.2)	11.1 (8.3)	12.3 (7.5)	11.1 (7.7)	11.6 (7.3)	11.1 (7.6)	13.0 (9.7)	11.0 (7.6)	15.3 (10.5)	11.0 (7.6)
INTELLIGENCE												
Stanford-Binet Matrices raw score M (SD)			16.7 (4.8)	17.6 (5.6)	16.5 (4.6)	17.6 (5.2)	17.3 (4.6)	17.6 (5.2)	16.6 (4.5)	17.6 (5.2)	15.6 (6.8)	17.6 (5.2)
Stanford-Binet Matrices standard score category		Above average %	5.4	6.6	4.0	6.6	7.5	6.6	3.7	6.6	8.3	6.7
		Average %	69.6	77.9	66.0	77.9	75.0	77.8	70.4	77.9	66.7	78.1
		Below average %	25.0	15.5	30.0	15.5	17.5	15.6	25.9	15.5	25.0	15.3

Appendix I: Independent Variable Profile of People who Became CPGI 5+ Problem Gamblers (PG) in the Next Assessment (A) for the First Time versus People who Stayed Non-Problem Gamblers (NPG) in the Next Assessment in LLLP

		Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile	
p < .05 (2 tail); p < .01 (2 tail)		Became PG next Assessment	Stayed NPG next Assessment	Became PG in Assessment 2	Stayed NPG in Assessment 2	Became PG in Assessment 3	Stayed NPG in Assessment 3	Became PG in Assessment 4	Stayed NPG in Assessment 4
		n = 21	n = 951	n = 28	n = 1087	n = 8	n = 888	n = 7	n = 840
DEMOGRAPHICS									
Male %		51.1	40.7	57.1	41.2	50.0	40.3	28.6	40.4
Age M (SD) (Baseline range[61]: 18-66)		40.1 (16.9)	40.9 (17.4)	40.3 (16.3)	39.1 (17.4)	36.5 (16.7)	41.1 (17.4)	43.3 (19.6)	42.9 (17.4)
Initial Age Category	18-20 %	17.9	21.6	17.9	21.6	--	--	--	--
	23-25 %	17.9	23.0	17.9	23.0	--	--	--	--
	43-45 %	42.9	30.1	42.9	30.1	--	--	--	--
	63-65 %	21.4	25.3	21.4	25.3	--	--	--	--
Immigrant %		9.3	11.3	10.7	11.1	12.5	11.3	0	11.7
Ethnicity (participants able to choose more than 1 category)	Aboriginal/Métis/Inuit %	0	5.2	0	5.2	--	--	--	--
	Canadian %	3.6	9.8	3.6	9.8	--	--	--	--
	African %	0	0.3	0	0.3	--	--	--	--
	Asian (Eastern) %	10.7	3.1	10.7	3.1	--	--	--	--
	Asian (Southern) %	3.6	2.1	3.6	2.1	--	--	--	--
	Asian (Western) %	0	0.9	0	0.9	--	--	--	--
	European (Northern) %	17.9	18.0	17.9	18.0	--	--	--	--
	European (Eastern) %	7.1	17.6	7.1	17.6	--	--	--	--
	European (Western) %	64.3	71.0	64.3	71.0	--	--	--	--
	Latin American %	0	0.3	0	0.3	--	--	--	--
	Other ethnicity %	3.6	2.7	3.6	2.7	--	--	--	--
Non-Caucasian %		14.0	8.4	14.3	8.7	12.5	8.3	14.3	8.1
Adopted %		2.3	2.6	3.6	2.8	0	2.6	0	2.3
Educational Attainment	< High school graduation %	2.5	5.4	3.8	5.2	0	5.5	0	5.5
	High school graduate %	12.9	8.9	11.5	9.0	16.7	8.8	14.3	8.9
	Some post-secondary %	28.0	22.9	34.6	22.7	16.7	23.0	14.3	22.9
	Completed vocational school or college %	24.1	22.5	19.2	22.6	49.9	22.3	14.3	22.5
	University Bachelor's degree %	27.4	27.7	23.1	27.7	16.7	27.6	57.1	27.7
	Graduate or professional degree %	5.1	12.7	7.8	12.8	0	12.8	0	12.5
Marital Status	Never married %	39.5	35.7	35.7	40.0	62.5	34.5	28.6	31.3
	Married %	30.2	43.6	35.7	41.0	12.5	44.1	28.6	46.6
	Living common-law %	20.9	8.8	14.3	7.5	25.0	9.6	42.9	9.8
	Separated or divorced %	4.6	9.1	7.1	8.9	0	9.1	0	9.3
	Widowed %	4.6	2.8	7.1	2.6	0	2.7	0	3.0
Employment Status	Unemployed %	32.6	30.3	25.0	29.6	50.0	31.4	42.9	30.2
	Employed part-time %	16.3	22.3	17.9	24.4	0	21.6	28.6	20.4

[61] Depending on the variable, range either represents observed minimum and maximum values or *potential* minimum and maximum values.

p < .05 (2 tail); p < .01 (2 tail)		Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile	
		Became PG next Assessment	Stayed NPG next Assessment	Became PG in Assessment 2	Stayed NPG in Assessment 2	Became PG in Assessment 3	Stayed NPG in Assessment 3	Became PG in Assessment 4	Stayed NPG in Assessment 4
		n = 21	n = 951	n = 28	n = 1087	n = 8	n = 888	n = 7	n = 840
	Employed full-time %	51.1	47.4	57.1	46.0	50.0	47.0	28.6	49.5
	Attending school %	21.5	16.3	10.7	25.8	25.0	21.0	28.6	16.3
Household income	$0-$19,999 %	4.7	6.7	0	6.2	25.0	7.9	0	6.2
	$20,000-$29,999 %	2.3	6.0	3.6	5.5	0	6.4	0	6.2
	$30,000-$39,999 %	2.3	7.2	3.6	6.6	0	8.1	0	6.9
	$40,000-$49,999 %	4.7	8.4	3.6	8.1	0	8.6	14.3	8.7
	$50,000-$59,999 %	7.0	8.2	10.7	7.6	0	7.7	0	9.4
	$60,000-$79,999 %	13.9	16.7	21.4	16.2	0	18.6	0	15.4
	More than $80,000 %	65.1	46.8	57.1	49.8	75.0	42.8	85.7	47.3
Household debt ($) M (SD)		55091 (89047)	52188 (122916)	40473 (77937)	17681 (61328)	26005 (47473)	70617 (179513)	146804 (181001)	77361 (142781)
Location	Calgary %	44.2	43.9	53.6	43.7	25.0	44.0	28.6	43.9
	Edmonton %	41.8	29.8	35.7	30.1	50.0	29.7	57.1	29.4
	Grande Prairie %	7.0	11.9	3.6	11.7	25.0	12.1	0	12.0
	Lethbridge %	7.0	14.4	7.1	14.5	0	14.2	14.3	14.6
PHYSICAL HEALTH									
PHYSICAL FUNCTIONALITY	Perceptual, communicative, motor, or learning impairment %	23.2	21.5	21.4	22.4	25.0	21.1	28.6	20.8
HEALTH STATUS	Physical health rating M (SD) (Range: 1 - 6; 6 = excellent)	4.4 (1.2)	4.7 (1.1)	4.4 (1.1)	4.7 (1.0)	4.1 (1.5)	4.7 (1.1)	4.6 (1.5)	4.6 (1.1)
	Currently taking Rx medication %	28.6	48.9	--	--	--	--	28.6	48.9
GAMBLING									
GAMBLING ATTITUDES	Gambling Attitudes Measure M (SD) (Range: -4 to +4)	0.4 (1.6)	0.2 (1.9)	0.3 (1.8)	0.2 (1.9)	0.1 (1.5)	0.2 (1.9)	1.1 (0.7)	0.3 (1.8)
	Gambling Attitudes Questionnaire M (SD) (Range: 1-7; lower scores indicate belief gambling harmless)	4.1 (1.0)	4.1 (1.0)	4.2 (1.2)	4.0 (1.1)	3.6 (0.7)	4.2 (0.9)	4.5 (0.8)	4.2 (1.0)
LIFETIME GAMBLING	Age first gambled M (SD)	17.6 (8.4)	18.7 (7.8)	18.3 (9.9)	19.4 (8.8)	16.9 (6.4)	18.2 (7.1)	15.3 (4.9)	18.3 (7.1)
	Big win when first started gambling %	55.0	20.1	63.0	21.2	37.5	20.4	42.9	18.3
	Big loss when first started gambling %	14.4	8.8	18.5	8.4	12.5	9.0	0	9.2
	*Parent(s)/sibling(s) do/did gamble regularly [62] %	46.5	21.0	46.4	21.6	62.5	20.3	28.6	21.0
	* Parent(s) gambled with person when growing up %	44.2	26.2	46.4	26.8	50.0	25.8	28.6	25.8
	* Parent(s) are/were problem gambler(s) %	9.3	4.8	10.7	5.2	0	4.5	14.3	4.5
	* Siblings are/were problem gamblers %	4.6	3.3	7.1	3.6	0	3.2	0	3.1
	Largest amount lost in one single year $ M (SD)	493 (674)	414 (1961)	541.46 (739)	237.77 (652)	380.00 (408)	532.90 (2811)	429.29 (715)	516.43 (2755)
	Median	255.81	80.69	275	50	150	100	100	100

---

[62] Asterisks indicate question only asked to people losing >$365 in any year, betting >10 times in life, and endorsing at least one of 15 problems associated with gambling (survey questions 227.A-241.O).

p < .05 (2 tail); p < .01 (2 tail)

			Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile	
			Became PG next Assessment	Stayed NPG next Assessment	Became PG in Assessment 2	Stayed NPG in Assessment 2	Became PG in Assessment 3	Stayed NPG in Assessment 3	Became PG in Assessment 4	Stayed NPG in Assessment 4
			n = 21	*n* = 951	*n* = 28	*n* = 1087	*n* = 8	*n* = 888	*n* = 7	*n* = 840
PAST YEAR GAMBLING	Frequency of gambling in typical month *M (SD)* 1 = Not in past year 2 = 1-5/year 3 = 6-11/year 4 = 1/month 5 = 2-3/month 6 = 1/week 7 = 2-6/week 8 = daily (means and medians calculated for entire group, including individuals who did not engage in the format)	Lottery tickets	2.39 (1.80)	2.26 (1.69)	1.64 (1.6)	1.35 (1.2)	4.00 (1.9)	2.89 (2.0)	3.57 (2.5)	2.77 (2.0)
		Raffle or fund-raising tickets	2.12 (1.45)	1.79 (1.0)	2.11 (1.4)	1.77 (1.1)	2.38 (1.6)	1.86 (1.0)	1.86 (1.5)	1.75 (.88)
		Instant win tickets	2.51 (1.78)	1.85 (1.42)	2.57 (2.0)	1.97 (1.6)	3.25 (2.1)	1.88 (1.4)	1.43 (.54)	1.67 (1.2)
		Bingo	1.46 (1.14)	1.12 (.61)	1.32 (1.1)	1.15 (.7)	1.87 (1.6)	1.13 (.6)	1.57 (.8)	1.07 (.5)
		EGMs	2.30 (1.67)	1.43 (.90)	2.43 (1.5)	1.40 (.9)	2.25 (1.7)	1.47 (.9)	1.86 (2.3)	1.43 (.9)
		Casino table games	1.70 (1.22)	1.18 (.64)	1.79 (1.5)	1.20 (.7)	2.00 (1.3)	1.19 (.7)	1.0 (0)	1.14 (.5)
		Private games for money	2.35 (1.89)	1.53 (1.17)	2.36 (1.8)	1.58 (1.3)	2.88 (2.2)	1.52 (1.16)	1.71 (1.9)	1.44 (1.0)
		Sport betting	1.42 (.84)	1.25 (.87)	1.39 (.9)	1.24 (.9)	1.75 (1.0)	1.23 (.8)	1.14 (.4)	1.27 (.9)
		Horse races	1.05 (.20)	1.08 (.37)	1.04 (.2)	1.09 (.4)	1.13 (.35)	1.09 (.35)	1.0 (0)	1.06 (.35)
		High risk stocks	1.30 (.72)	1.10 (.55)	1.46 (1.1)	1.11 (.6)	1.0 (0)	1.10 (.51)	1.0 (0)	1.09 (.53)
		Casinos outside Alberta	1.23 (.46)	1.14 (.46)	1.21 (.4)	1.10 (.4)	1.38 (.74)	1.15 (.4)	1.14 (.4)	1.19 (.6)
	Frequency, all forms in past year *M (SD)* (Range: 0-30)		5.90 (6.45)	2.42 (3.91)	7.2 (9.0)	2.6 (5.3)	3.3 (0.8)	2.3 (4.0)	3.7 (2.7)	2.3 (2.0)
	Gambled on Internet in any form %		16.26	9.78	21.4	6.5	12.5	11.9	0	11.8
	# of types of gambling engaged in *M (SD)* (Range: 0-13)		3.83 (2.67)	2.44 (2.02)	3.6 (3.0)	2.0 (1.8)	5.6 (2.1)	2.9 (2.2)	2.71 (1.98)	2.51 (2.1)
	Gambling Expenditure $ (net win/loss in typical month) *M (SD)* (Note: actual values used in Assessments 1 and 2 and absolute values used in Assessments 3 and 4) (Means and medians only	Lottery tickets	-45.71 (58)	-33.28 (128)	missing data	missing data	-45.71 (58)	-33.28 (128)	Insufficient data	--
		Median	-20	-10	--	--	-20.00	-10.00	--	--
		Raffle or fund-raising tickets	-30.7 (100)	-18.5 (89)	-38.56 (124)	-15.5 (47)	-3.33 (17)	-22.2 (141)	Insufficient data	--
		Median	-5.6	-7.2	-5.00	-5.00	-7.5	-10	--	--
		Instant win tickets	-59.3 (326)	-11.4 (51)	-59.3 (326)	-11.5 (47)	-37.83 (58)	-11.2 (55)	Insufficient data	--
		Median	-6.1	-5.0	-5	-5	-10	-5	--	--
		Bingo	-55.6 (56)	-40.0 (90)	-60.0 (55.7)	-50.85 (103)	-40.00 (57)	-26.8 (73.2)	Insufficient data	--
		Median	-47.8	-18.3	-50	-25	-40	-10	--	--
		EGMs	-162.5 (633)	-28.9 (301)	-190.1 (742)	-44.2 (336)	-66.0 (251)	-10.1 (257)	Insufficient data	--
		Median	-35.6	-15.5	-40	-20	-20	-10	--	--
		Casino table games	-157.4 (284)	-55.4 (214)	-210.7 (278)	-62.4 (105)	+29.0 (306)	-46.9 (347)	Insufficient data	--
		Median	-57.8	-25.5	-80	-30	+20	-20	--	--

p < .05 (2 tail); p < .01 (2 tail)

			Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile	
			Became PG next Assessment	Stayed NPG next Assessment	Became PG in Assessment 2	Stayed NPG in Assessment 2	Became PG in Assessment 3	Stayed NPG in Assessment 3	Became PG in Assessment 4	Stayed NPG in Assessment 4
			n = 21	n = 951	n = 28	n = 1087	n = 8	n = 888	n = 7	n = 840
	calculated for people participating in format)	Private games for money	-39.8 (136)	-11.3 (218)	-66.0 (126)	-51.9 (184)	+52.0 (169)	38.4 (259)	Insufficient data	--
		Median	-13.3	-11.0	-20	-20	+10	0	--	--
		Sport betting	-46.1 (82)	-12.8 (91)	-30.0 (69)	-24.5 (59)	-102.5 (127)	+1.49 (130)	Insufficient data	--
		Median	-19.4	-4.6	-5	-10	-70	+2	--	--
		Horse races	Insufficient data	--	Insufficient data	-24.7 (38)	Insufficient data	+18.9 (74)	Insufficient data	--
		Median	--	--	--	--	--	--	--	--
		High risk stocks	-3490 (6754)	2183 (4953)	-3490 (6754)	2183 (4953)	Insufficient data	-3881 (18487)	Insufficient data	--
		Median	-200	-500	-200	-500	--	-175	--	--
		Casinos outside Alberta	-672 (1652)	-161 (627)	-672 (1652)	-161 (627)	Insufficient data	+25.68	Insufficient data	--
		Median	90	20	90	20	--	+20.0	--	--
	Expenditure on all forms combined M (SD)		-951.6 (3085)	-434.3 (3085)	-1299 (4587)	-214 (1279)	-489 (463)	-585.9 (4634)	-90.7 (73.1)	-559 (3784)
	Median		-145	-31.5	-122.5	-15	-272.5	-53	-90	-30
	Expenditure on all forms combined category (Range 0-7)		2.2 (1.7)	1.4 (1.4)	2.29 (1.98)	1.13 (1.22)	2.88 (1.45)	1.63 (1.56)	1.14 (.90)	1.36 (1.49)
	Median		1.9	1.0	2.0	1.0	2.5	1.0	1.0	1.0
	Largest single day loss in past year ($) M (SD)		1310 (3243)	539 (4897)	1879.7 (4784)	453 (3567)	273.25 (304)	612.0 (5413)	213.7 (436)	572 (6073)
	Median		145	27	170	20	143	33	50	30
	Total time (minutes) on all types of gambling per occasion M SD		303.7 (316)	127.4 (219)	309.4 (346)	127.2 (224)	342.0 (258)	138.1 (226)	237.0 (260)	116.2 (205)
GAMBLING MOTIVATION M (SD) (Range: 1-4; 1=a lot; 4=not at all)	For excitement		2.7 (1.0)	3.0 (.9)	missing data	missing data	missing data	missing data	2.7 (1.0)	3.0 (.9)
	To relax/have fun		2.9 (.9)	2.7 (1.0)	missing data	missing data	missing data	missing data	2.9 (.9)	2.7 (1.0)
	To win money		2.1 (.9)	2.6 (1.0)	missing data	missing data	missing data	missing data	2.1 (.9)	2.6 (1.0)
	To be with friends/make new friends		3.1 (1.1)	3.0 (1.1)	missing data	missing data	missing data	missing data	3.1 (1.1)	3.0 (1.1)
Drink alcohol or use drugs when gambling M (SD) (Range: 1-5; never to most of the time)			1.7 (1.2)	1.6 (1.0)	1.7 (1.2)	1.6 (1.1)	missing data	missing data	1.9 (1.2)	1.5 (.96)
Dissociate when gambling M (SD) (Range: 1-4; 1= often, 4= never)	Lose track of time		2.7 (1.1)	3.5 (.8)	missing data	missing data	missing data	missing data	2.7 (1.1)	3.5 (.8)
	Go into trance-like state		3.4 (1.0)	3.9 (.4)	missing data	missing data	missing data	missing data	3.4 (1.0)	3.9 (.4)
	Feel outside body as if watching self gamble		3.6 (.8)	4.0 (.2)	missing data	missing data	missing data	missing data	3.6 (.8)	4.0 (.2)
GAMBLING SOCIAL EXPOSURE	Percentage of close friends that gamble regularly M (SD)		22.6 (30)	14.2 (23)	23.9 (28.2)	16.5 (25.0)	missing data	missing data	18.1 (36.2)	11.4 (20.4)
	Amount of gambling at work or		1.7	1.7	1.8	1.8	missing data	missing data	1.4	1.7

		Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile	
p < .05 (2 tail); p < .01 (2 tail)		Became PG next Assessment	Stayed NPG next Assessment	Became PG in Assessment 2	Stayed NPG in Assessment 2	Became PG in Assessment 3	Stayed NPG in Assessment 3	Became PG in Assessment 4	Stayed NPG in Assessment 4
		n = 21	*n = 951*	*n = 28*	*n = 1087*	*n = 8*	*n = 888*	*n = 7*	*n = 840*
	school M (SD) (Range: 1-4; 1= a lot)	(.7)	(.8)	(.74)	(.83)			(.55)	(.74)
	Attended information session on problem gambling %	0	2.2	0	3.4	0	1.5	0	1.5
GAMBLING FALLACIES	Gambling Fallacies Measure *M (SD)* (Range: 0-10: 10 = no fallacies)	6.0 (1.7)	7.1 (1.4)	6.1 (1.7)	6.8 (1.6)	5.6 (2.1)	7.3 (1.4)	5.9 (1.3)	7.4 (1.2)
GAMBLING AVAILABILITY	Casino/racino density *M (SD)* (Range: 0-4; number within 5 km)	0.4 (0.7)	0.5 (0.8)	0.5 (0.8)	0.6 (0.9)	0.3 (0.5)	0.5 (0.8)	0.3 (0.5)	0.5 (0.8)
	Casino/racino driving distance (km) *M (SD)* (Range: 0.2-449.3)	10.0 (11.4)	15.8 (31.1)	11.3 (15.3)	15.5 (33.0)	7.7 (3.7)	15.7 (30.4)	7.2 (4.4)	16.2 (29.4)
PERSONALITY									
PERSONALITY TRAITS NEO-FFI/NEO-PI-R Raw Scores *M (SD)*	Neuroticism	79.8 (22.4)	74.2 (23.6)	79.5 (21.4)	74.3 (23.5)	85.1 (23.9)	74.1 (23.6)	75.0 (24.5)	74.1 (23.6)
	Depression	13.0 (5.9)	11.5 (5.9)	12.6 (5.7)	11.6 (5.9)	14.6 (6.4)	11.5 (5.9)	12.9 (6.4)	11.5 (5.9)
	Vulnerability	10.2 (3.6)	9.5 (4.3)	9.9 (3.9)	9.6 (4.3)	11.1 (2.9)	9.5 (4.3)	10.4 (3.4)	9.5 (4.3)
	Impulsivity	17.1 (4.9)	15.4 (4.6)	17.3 (4.6)	15.4 (4.6)	17.8 (5.2)	15.4 (4.6)	15.6 (5.8)	15.4 (4.6)
	Extraversion	116.2 (16.3)	115.7 (19.0)	116.9 (15.5)	116 (19)	115.6 (16.9)	115.6 (19.0)	114.3 (18.8)	115.5 (19.1)
	Excitement-seeking	19.3 (4.9)	17.8 (5.2)	20.0 (3.9)	18.0 (5.3)	17.4 (5.9)	17.8 (5.2)	18.6 (8.0)	17.7 (5.2)
	Openness	30.0 (5.8)	30.3 (6.3)	30.1 (5.5)	30.4 (6.2)	27.6 (6.1)	30.3 (6.3)	32.1 (6.8)	30.3 (6.3)
	Agreeableness	33.0 (6.2)	33.6 (5.5)	33.0 (6.3)	33.5 (5.6)	33.1 (5.2)	33.6 (5.5)	33.1 (6.9)	33.6 (5.5)
	Conscientiousness	32.6 (7.6)	34.0 (6.4)	33.6 (6.7)	33.8 (6.4)	28.5 (9.8)	34.0 (6.4)	33.1 (8.9)	34.1 (6.4)
STRESS									
PAST YEAR STRESS	Life Events Scale *M (SD)* (Range: 0-42) [63]	11.6 (5.4)	7.8 (4.4)	15.5 (6.5)	14.5 (6.4)	5.4 (4.3)	3.8 (3.2)	3.1 (2.5)	3.5 (3.0)
	PAI Clinical Levels of Stress raw score *M (SD)*	5.7 (4.1)	5.3 (4.0)	5.7 (4.1)	5.3 (4.0)	--	--	--	--
Coping Inventory for Stressful Situations *M (SD)* (Range: 21-105; higher scores = more coping strategies)		61.8 (14.0)	60.6 (11.4)	--	--	62.6 (12.4)	61.9 (11.3)	60.8 (15.8)	59.3 (11.5)
WELL BEING	Happiness level *M (SD)* (Range: 0-10; higher scores = more happiness)	7.9 (2.3)	7.6 (2.1)	--	--	--	--	7.9 (2.3)	7.6 (2.1)
	Life satisfaction *M (SD)* (Range: 0-10)	7.3 (1.4)	7.6 (1.9)	--	--	--	--	7.3 (1.4)	7.6 (1.9)
	Personal Wellness Index *M (SD)* (Range: 0-100)	75.7 (16.4)	73.1 (16.4)	--	--	--	--	75.7 (16.4)	73.1 (16.4)
LIFETIME STRESS	Childhood Trauma Score *M (SD)*	40.2 (14.4)	36.2 (12.4)	40.1 (16.0)	36.5 (12.9)	44.1 (13.1)	36.0 (12.1)	36.3 (9.2)	36.0 (12.1)

[63] Different scoring system used in Assessment 1

		Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile	
p < .05 (2 tail); p < .01 (2 tail)		Became PG next Assessment	Stayed NPG next Assessment	Became PG in Assessment 2	Stayed NPG in Assessment 2	Became PG in Assessment 3	Stayed NPG in Assessment 3	Became PG in Assessment 4	Stayed NPG in Assessment 4
		n = 21	n = 951	n = 28	n = 1087	n = 8	n = 888	n = 7	n = 840
MENTAL HEALTH									
MENTAL DISORDERS	Major Depressive Disorder %	17.2	9.6	17.9	9.7	--	--	14.3	9.5
	Generalized Anxiety %	8.5	7.6	7.1	3.5	--	--	14.3	12.8
	Panic Attacks &/or Agoraphobia %	11.4	7.2	10.7	6.9	--	--	14.3	7.5
	Specific Phobias %	22.9	11.3	25.0	12.7	--	--	14.3	9.4
	Social Phobias %	2.9	3.8	3.6	3.6	--	--	0	4.0
	Obsessive Compulsive Disorder %	8.6	3.9	10.7	4.1	--	--	0	3.7
	Any Above CIDI Diagnosis %	42.9	28.6	50.0	27.9	--	--	14.3	29.4
	Attention Deficit Hyperactivity Disorder %	14.3	8.3	--	--	--	--	14.3	8.3
Eating Disorders	Adult Eating Disorder Scale M (SD) (Range: 0-5)	0.14 (0.38)	0.35 (0.74)	--	--	--	--	0.14 (0.38)	0.35 (0.74)
	Anorexia Nervosa or Bulimia %	0	8.0	--	--	--	--	0	8.0
PAI Clinical Scales Raw Scores M (SD)	Somatic Complaints	15.0 (9.4)	12.2 (9.8)	15.0 (8.5)	11.2 (9.9)	15.1 (12.4)	11.3 (9.7)	--	--
	Anxiety	17.4 (9.3)	15.0 (9.0)	17.7 (9.2)	15.0 (9.9)	16.3 (9.5)	15.1 (7.9)	--	--
	Anxiety Related Disorders	19.5 (6.6)	17.7 (7.9)	19.8 (6.4)	17.6 (7.9)	18.4 (7.2)	17.9 (7.9)	--	--
	Depression	15.6 (9.0)	13.7 (9.3)	15.2 (9.2)	13.5 (9.1)	17.0 (8.2)	14.0 (9.5)	--	--
	Mania	22.8 (7.7)	23.6 (8.9)	23.6 (7.6)	24.0 (9.0)	19.9 (7.9)	23.2 (8.7)	--	--
	Paranoia	17.1 (7.1)	12.8 (6.6)	19.0 (8.1)	17.1 (8.1)	10.6 (3.8)	7.5 (4.8)	--	--
	Schizophrenia	11.9 (5.7)	9.8 (5.9)	14.1 (6.6)	13.6 (7.2)	4.1 (2.6)	5.2 (4.3)	--	--
	Borderline Features	20.4 (9.7)	17.6 (10.2)	19.2 (9.4)	17.9 (10.1)	24.6 (10.6)	17.2 (10.4)	--	--
	Aggression	14.1 (7.9)	12.2 (7.7)	12.4 (7.73)	12.6 (7.9)	19.9 (8.7)	11.8 (7.5)	--	--
	Suicidal Ideation	3.5 (4.0)	3.4 (4.9)	3.4 (4.3)	3.4 (4.8)	3.8 (2.8)	3.4 (5.0)	--	--
SUBSTANCE USE, ABUSE, AND DEPENDENCE	Tobacco user %	37.2	22.2	35.7	24.6	50.0	21.7	28.6	19.5
	Level of alcohol use M SD (Range 0 – 4; 0 = never)	2.65 (.62)	2.56 (.83)	2.61 (.74)	2.52 (.83)	2.50 (.76)	2.48 (.86)	3.00 (0)	2.69 (.80)
	Illicit drug use %	32.6	22.5	35.7	24.5	37.5	20.9	14.3	21.7
	Alcohol dependence %	10.7	10.6	10.7	10.6	missing data	missing data	missing data	missing data
	Drug dependence (Illicit drugs; non-medical use of licit drugs) %	2.3	2.3	3.6	3.0	0	1.9	0	1.7
SOCIAL FUNCTIONING									
	Heterosexual %	90.0	94.2	84.6	94.4	100.0	94.1	100.0	94.0

			Average		Assessment 1 IV Profile		Assessment 2 IV Profile		Assessment 3 IV Profile	
p < .05 (2 tail); p < .01 (2 tail)			Became PG next Assessment	Stayed NPG next Assessment	Became PG in Assessment 2	Stayed NPG in Assessment 2	Became PG in Assessment 3	Stayed NPG in Assessment 3	Became PG in Assessment 4	Stayed NPG in Assessment 4
			n = 21	*n* = 951	*n* = 28	*n* = 1087	*n* = 8	*n* = 888	*n* = 7	*n* = 840
SOCIAL FUNCTIONING AND SUPPORT		Marital satisfaction %	65.6	78.7	71.4	85.2	66.7	77.8	40.0	71.4
		PAI Social Non-Support raw score *M (SD)*	6.6 (3.9)	6.1 (3.9)	6.6 (3.9)	6.1 (3.9)	--	--	--	--
		Family Environment Scale *M (SD)* (Range: 22-76)	55.6 (8.8)	54.3 (8.2)	56.8 (8.6)	54.4 (7.9)	55.5 (10.6)	54.4 (8.2)	51.0 (7.8)	54.0 (8.5)
		Neighbourhood Cohesion Index *M (SD)* (Range: 2-10; higher scores = decreased cohesion)	5.5 (1.9)	5.3 (2.0)	5.5 (2.2)	5.3 (2.0)	5.8 0.7	5.4 (2.0)	5.0 (1.9)	5.1 (2.0)
		Social Networks Scale *M (SD)* (Range: 0-50; higher scores indicate decreased risk for isolation)	31.9 (7.1)	32.0 (6.8)	31.9 (7.6)	32.6 (6.5)	31.8 (5.6)	31.2 (6.8)	32.3 (7.0)	32.2 (7.1)
RELIGION	Religious affiliation	Catholic %	26.3	19.1	29.6	19.0	25.0	19.0	14.3	19.4
		Other Christian religion %	28.6	31.0	29.6	30.6	12.5	31.1	42.9	31.4
		No religion %	13.5	31.2	7.4	26.6	25.0	25.7	24.8	42.9
		Other religion %	32.6	16.8	33.3	23.7	37.5	24.1	24.0	0
		Religiosity Scale *M (SD)* (Range: 0-26; higher scores indicate greater belief)	14.1 (6.8)	13.3 (7.8)	15.4 (6.6)	13.4 (7.7)	--	--	9.1 (7.4)	13.1 (8.0)
ILLEGAL BEHAVIOUR AND ANTISOCIALITY		Illegal activities in lifetime %	0	0.6	0	0	0	1.5	0	0.4
		PAI Antisocial Features raw score *M (SD)*	17.4 (10.9)	14.3 (9.2)	17.4 (11.0)	15.3 (9.6)	17.4 (10.4)	13.0 (8.6)	--	--
COGNITIVE FUNCTIONING										
Wechsler Abbreviated Scale of Intelligence		IQ *M (SD)*	107.2 (13.1)	111.1 (12.3)	107.0 (13.3)	110.8 (12.3)	108.1 (9.7)	111.3 (12.3)	107.0 (16.4)	111.4 (12.2)
		Above average %	53.6	56.2	53.6	56.2	--	--	--	--
		Average %	32.1	38.6	32.1	38.6	--	--	--	--
		Below average %	14.3	5.3	14.3	5.3	--	--	--	--
Wisconsin Card Sorting Task (> 16th percentile)		Total Errors %	71.4	78.6	71.4	78.6	--	--	--	--
		Perseverative Response %	85.7	84.6	85.7	84.6	--	--	--	--
		Perseverative Errors %	85.7	83.1	85.7	83.1	--	--	--	--
		Non-Perseverative Errors %	67.9	75.8	67.9	75.8	--	--	--	--

Appendix J: Open-Ended Responses to the Question "What would you say has caused your gambling problems?" Organized into Themes (QLS data)

Assessment 2

DESIRE TO WIN MONEY

- debt and taxes
- desire for instant cash
- desire to clear debts
- feeling that you can win to pay bills
- I would say to overcome financial problems and to pay off bills quicker with my winnings. Also, relieves pressure from just counting on my pay and retirement checks. It gives me a bit of extra money for monthly bills, car and travel expenses.
- the desire to win
- wish to win
- myself trying to win
- The belief that just once I will win really big
- wanting to win
- Wanting to win to make my life more comfortable.
- trying to win the jackpot
- Need for easy money!
- The lure of the big hit...
- addictiveness to winning...you want to get that big winner no matter how much you spend

BOREDOM/EXCITEMENT

- Boredom
- Entertainment and to relieve boredom
- perhaps boredom
- I find it exciting when I need excitement or am bored I want to gamble
- lack of hobbies
- lack of other interests or entertainment
- the need for excitement
- excitement-time consuming-international interests
- i like to gamble and enjoy in winning
- I'm not sure its a thrill to win

- the thrill of winning that big win
- The thrill and fun of possibly winning money .on the sports that I love.
- The flash the excitement....   the sharing with friends when there is a win and whining at the losses
- Internet site with gambling. One major thing that has helped is credit card companies will no longer allow the transfer of money. This is the best thing they ever did.
- I love games and bingo is a convenient location
- Too much available money and spare time to scratch tickets, too easy access
- enjoy it too much and too easy to do
- bored on days off and want to win big

STRESS/DEPRESSION/ESCAPE

- stress
- stress
- personal problems at work and home
- stress related to depression (bipolar) of partner - gamble as a form of escape
- no job and severe health problems
- unhealthy relationship
- feeling of non importance
- …………I live a life where every day I have to gamble. I deal with the public. Some people do NOT pay for my work. They can under current laws even get away with it. Dealling with the public can sometimes overwelm me. I need a break. The closest way to do this without leaving the area too far that i can not still be reachable to do my job if I am called is gambling. It takes me into a world of fantasy and fun for a few hours. I hate that it can be expensive to do this but I do not know of other methods to experiance this escape. I do have a hobby. I do watch movies. Gambling one of the nights is one night that gives me one more chance of escaping..
- Uncertainty how often my wife is gambling and the amount of money spend.
- I was having problems with my common law husband so l would take money from his wallet when he was too drunk to notice and put it in the slots and lose it all.
- move to a new area, sudden disability, loss of professional status, loss of supportive network, isolation and need for social contact, depression and loss of self esteem, loss of family respect leading to further depression and self destructive behaviour
- stress and the wanting to have more money
- Stress-from work-a couple of coworkers go to Bingo and on a couple of occassions one of them won in the hundreds and in another time in the thousands. Stress-personal finances
- I am caregiver for my mother. Getting away to slots, scratching tickets is an escape for me. I am also a recovering alcoholic (sober 4 years), and I am very susceptible to many addictions, food, gambling, etc.

DENIAL OF PROBLEM

- don't have a problem, trade the stock market daily and try to win most of the time
- dont have one
- Anxiety when I lose. Otherwise, there is no problem.

- I do not have a gambling problem as I would like to say I'm in control of my gambling spending. I try to take a certain amount of money and when that is done I'm out of there.
- I don't believe I have a gambling problem
- n/a
- n/a
- n/a
- n/a
- I don't feel that I have a problem
- I don't have a gambling problem
- I don't have gambling problems
- have no problems
- I don't have a gambling "problem", except I am not yet a big enough cash player
- i have no gambling problems
- I dont have a problem.
- its not a problem
- just my daughter thinks I bingo too much, she would like to see me spend more time with her dad but we are fine with doing our own thing..
- not a problem
- wouldn't say i had i problem, but do go more if i have alot going on but not going as often due to lack of money
- Not me my son has a gambling problem. he goes to often and does not have the money to play.

AVAILABILITY OF GAMBLING

- access to track
- availability of slot machines
- being able to gamble in my own home on-line
- casino being to close; small betting leads to larger amounts
- casino to close to where I live
- too easy to get at alot of the stuff i like to play like scratch tickets right at your local cornor store
- too easy
- the availability of scratch tickets, and the possibility of winning a significant amount of money
- avalibility of places; wanting that big win
- accessability, looking back, i've always had cravings and liked the excitement of gambling, but never really started gambling regularily until i had access over the internet

DON'T KNOW

- no reason
- unknown
- not sure

- nothing
- I feel guilty when I lose and feel guilty that I have wasted my time playing slots and feel guilty playing slots because there is no actual skills used
- Prefer not to say.

ADDICTION

- addiction to slot machines
- addiction...
- controlling spending limits
- just being in the store seeing the tickets for sale and calling my name i can't walk away without buying at least 5 - 10 tickets to bring home to scratch
- my own self control
- roulette is very addictive and can become very expensive. I blew through 3000 in a couple of hours.

LOSING OR LACK OF MONEY

- not enough money to gamble
- not really having the extra $ to throw away
- losing
- Losing more money than winning.

SOCIAL

- My Aunt gambles at the slots on a regular basis and she usually talks me into it
- wife always wants to go and sometimes I don't go with her just give her money. but when I go with her I have no control, I go to win some money, no matter how much it cost me to win something.

CHASING

- thinking I can win the money back that i lost
- trying to win back losses and it never happens..
- I lose and then attempt to win the losses back.

OTHER

- don't worry about money like I normally do when I am at the casino
- eternal hope
- Being introduced to gambling at a young age.
- Poker

Assessment 3

DESIRE TO WIN MONEY

- desire to get rich quick
- Don't really know... just want to try and make some money at it
- lack of money. Trying to get more.
- Feeling that I do not have enough money to feel secure
- I hope to win more than I spend thus giving me some "extra" cash.
- I dont know I just like to try and win some money to make my life a little bit better financially.
- money
- low income
- trying to win enough for a better life
- was hoping to win money, to get out of debt
- Never make enough money for myself, always seems to go to mortgage, bills, insurance, etc
- trying to make a fast dollar, get money to pay some bills that come once a year.
- to make some money, pay bills, and i enjoy it.
- Utilize stock market for income as am semi retired.
- Trying to bettter our retirement.
- Looking for the big win!
- The lure of jackpots. The opportunity to hit a large jackpot. There is no other reason for anyone to go to a casino unless it is for the dinners/drinks. Certainly I wouldn't set foot in a casino that didn't have the opportunity for large jackpots.
- When someone wins the big one you feel the need to play so you can win too. If they can win why not you?
- need for money, diversion from problems to a lesser degree
- like to try and win it is fun

BOREDOM/EXCITEMENT

- boredom
- boredom
- boredome
- boredom and limited time to get out
- Only do it for something to do on occasion
- I like the feeling of the excitement i get
- My need for the adrinalin rush when I win. I believe I will win, if not today, then tomorrow
- I enjoy Bingo, even when not enough money.
- Instant rush

- When I am off at home and am bored I think hell I can affoard to throw $100.00 away then i take my debit card and clean out all I have, when I win small amounts I throw it back in because I didn't have it in the first place, I dont know when to leave.
- Boredom, excitement, meet people
- boredom and loneliness
- boredom...too easy to access
- just some where to go or get away for a break or try to win more money whitch dos'nt work
- I like the excitement and there is always the chance that I will win big money
- Enjoy the whole experience of playing, even when on a bad roll I want to keep going.
- I love to play bingo and when u win it is great
- At first the excitement and anticipation. Then to ban boredom. In the last four years to escape the stress of drawn-out class legal actions.

STRESS/DEPRESSION/ESCAPE

- Depression
- being alone and working to much
- depression and no self-confidence
- just a way to get from the house and the issues going on here at home
- stress, wife
- separation
- self confidence
- sadness
- The Lotteries make it look so easy to play and win, which cause one to forget how tricky lotteries can be. Stress from work and resentment of celebrities like Donald Trump doesn't help either.
- loneliness, emotional isolation, lack of friends and other activities, loss of self-esteem on disability, inability to do other activities

DENIAL OF PROBLEM

- do not have one
- don't have a gambling problem
- i dont have a problem
- I don't have a problem
- no problems
- I don't really think I have a gambling problem. I have learned not to spend as much money. I usually take $100 with me now and that's it. My husband and I have both agreed that we don't want to keep going to the cash machine for more money. So we just take the cash in and don't take any more. Also we have started to play the lower slots 5/2/1 cent machines just for fun.
- Just to clarify my responses, the only form of "gambling" I do is day trading/investing. I don't consider that to be gambling though.
- i really don't think i have a problem with gambling it's fun and a good way to meet people
- I do not gamble enough to say I have a problem. When I have gone to the casino its because there has been a group of us and its usually just for fun.

- I like to get out of the house with friends or family and some enjoy gambling at the casino. I do not believe that I have a problem

AVAILABILITY OF GAMBLING

- Nearness of gambling facility
- I worked at a casino.
- closeness of the casino (20 minutes away) and I like the atmosphere.

DON'T KNOW

- don't know
- nothing really
- not sure
- nothing
- unsure

ADDICTION

- I have an addictive personallity
- addiction to gambling
- addictive personality
- an addictive personality
- going once u win or lose your hooked.
- spent more and lost the money than I wanted to

LOSING OR LACK OF MONEY

- spending to much money
- The lack of being a winner at these games of chance. The Casinos not paying out enough
- Don't have a problem other than losing and not winning.
- decline in stock market and bad advice early in my working career to set up my own retirement plan instead of enrolling in a company play

SOCIAL

- association with others who gamble, became addicted, but am trying to stop and have not gone since September.

CHASING

- losing money and trying to win it back
- Trying to recoup lost money by increasing my wagers on table games where the odds are definitely in the Casino's favour.
- I lost a significant amount of money on the stock market and have been trying to recoup on the horses ever since. No success to date.

OTHER

- I think the main problem was the false belief that I could be as good at poker on the internet as I was with my friends and family playing poker at home. The reality turned out to be very different...and it became a problem. I have since quit playing as frequently on internet poker sites, and will only allow myself to spend $25 a month on it at most. I don't want to waste my money playing on the internet...I would rather drive to a casino and sit at a poker table and take my chances there.
- Once in a while when I go to the casino, I feel as if the slot machine is going to pay out (because they seem to be taking money for a long time)

and sometimes I spend slightly more than I wished to - but never enough to affect bills or mortgage etc.

- Poker is tough
- Slots
- volitility in the stock market provided opportunities for $ gain
- winning a big lottery made me feel I could do it again
- poor judgments while at the establishments
- Not smart enough, not working hard enough, world recession (slightly) buying wrong stock; buying too high selling too low; keeping stock too long

Assessment 4

DESIRE TO WIN MONEY

- I have won pretty good money before and keep trying for more
- I think it's an easy way to win money because I think of wins in the past instead of all the losses
- Need for Money
- need for more money
- need of money to relieve debts
- the lure to financial comfort or retire early
- trying to win money
- wanting to win big
- the recession. Wanting to win big money to pay for school.
- Need money and am bored at home
- The possibility of winning big, seperate myself from negative behaviour

BOREDOM/EXCITEMENT

- bordem
- bordom
- Bordom
- boredom
- boredom
- excitment
- need for entertainment
- boredom
- to much time on my hands
- somthing to do.
- i enjoy the excitement and the thrill but really can't affoed to so i play on line games that are free
- lack of excitement
- enjoy playing slots
- I just like to get out of the house so I always want to be at bingo
- My love of sports
- The excitement of winning, then the guilt of losing money I couldn't afford to lose.
- going for something to do or get my mind off things
- the fun in the game; winning is good; meeting people

- looking for excitement, initially. Now to get more money.
- I enjoy the slots and I have a husband who likes the slots and the horse races too. I realize we go to the slots more often then we should but I am quite content to come home after 3 or 4 hours whereas my husband will stay until there is no money left. He does gamble on the horses by telephone which i am not happy about because he takes money from one of our credit cards to play. I don't mind going but I would like to spend less money but on the other hand I am not going to argue with him about it. It is not worth it in order to save our marriage. …………………………………………………………………….. I don't really feel I have that much of an issue but it just frutrates me no end.
- enjoying the challenge and interaction

STRESS/DEPRESSION/ESCAPE

- Stress
- stress
- stress of job loss
- Depression
- health problems
- lonliness
- Anxiety, low self esteem
- personal problems/financial situation changed-divorce
- When I did go its usually because my husband has made me mad and I felt I deserved to be treated better so I treat myself. As well he never takes me anywhere without moaning about it so when he is at work I will go by myself.
- poor health
- Stress and boredom
- Stress associated with the days when I lose money playing online poker. The income from poker pays a significant number of bills while my wife is in school and has limited income.
- isolation, depression, low self esteem, limited social network

DENIAL OF PROBLEM

- don't have a gambling problem
- n/a
- Na
- no problem
- no problem
- no problems
- poker, I don't consider myself having a gambling problem. I deposit about $25 dollars a month and make on average $1500/month playing online poker
- I have lots of time on my hands and only give myself a $50 a month budget. I stick to it . There is no problem except when I get into tounaments that last longer then I expected , and I cant keep to schedules with family.

AVAILABILITY OF GAMBLING

- availabilty of poker games
- easy access online
- to easy to play
- So many bingos locally, have won jakcpot at almost all of them

DON'T KNOW

- dont know
- dont know
- Don't know
- i don't know
- not sure
- not sure
- nothing in particular
- dont gamble when money is tight

ADDICTION

- addictive personality
- addiction to slots
- I work full-time as a "day trader" and usually trade stocks and derivatives that would be considered high risk. However, I don't consider that a form of gambling. I do hundreds of transactions each week and have only lost money on a few trades. That said, I am definitely addicted to trading - and have found it impossible to stop or even to cut back.
- I have an addiction problem to everything. I was an alcoholic for 30 years--have been sober for six years. I smoke--can't shake that one. I am a foodaholic as well. I gamble when I am bored, or when I want escape.
- My addictive personality...Lack of judgement and stress from work.

LOSING OR LACK OF MONEY

- Losing
- too much of it.. LOL
- the casinos dont pay like they use to
- Not stopping after a nice win
- spending more than I intended to.

SOCIAL

- spouse has addictive personality and when we both go I can leave at any time but she can not leave until there is no money left. When we gamble together it costs us double plus spouse plays foolishly at the max from the start and tends to lose more often and faster.
- wife enjoys going

CHASING

- wanting to re-coup my loss
- Playing luck games and getting into a hole and having to pull myself out.
- The potential to win money to recover prior losses
- wanting to win back what was lost over the years, but end result is I lost more each time than I would actually win. Unfortunately, my husband loves to gamble and thus most of the time I go along with him.

OTHER

- chance
- exposed at an early age to gambling.
- Free Car give-away. Had to go to Bingo on days that I ordinarily don't go, because you had to be in attendance to win if your name was drawn. Went extra days to get extra ballots in the draw.
- I was prescribed "xxxxxxxx" in 2004 and when the dosage was increased my entire world turned upside down. I never had a gambling problem before, but when I was on "xxxxxxxxx" I couldn't think about anything or anyone, I just had to gamble.
- My whole life is a gamble in order to make a living. Its like playing on the "stock" market. Live stock that is.
- instant scratch tickets
- just me
- neglect household duties
- Parents that don't drive wanting to go to the casino
- Stupidity. Who in their right mind would gamble for 80/20 odds? Of course society gambles on everything...stock market...horses...lottery games...buying a vehicle...getting married...driving the 401. Gambling is part of the fabric. However, that doesn't make it ethical, moral or an asset.
- the change to more nickel machines and less quarter machines

Assessment 5

DESIRE TO WIN MONEY

- financial stress and debt
- a few jackpot wins at the casino
- always trying to hit the big one
- Needing money
- don't get a lot of income, so try to win more money.
- Money
- the desire to have more money
- Despite the fact that i almost always loose money, i still go back hoping for that big win. The need for money makes me gamble - quick fix
- try to get out of debt
- trying for the quick win, win more money to assist to pay bills.
- trying to win enough to not have to worry bout money
- try'n to win to get myself out of the dog house
- the thought of making easy money
- risk reward, wanting to get ahead, the chance that I might not have to work longer
- trying to win the jack pot. and to have fun

BOREDOM/EXCITEMENT

- boredom
- Boredom
- boredom
- boredom
- sometimes it is lack of excitment in my daily life; sometimes I am bored with my daily routine
- Boredom
- percieved free time
- just for something to do
- needed the excitement
- its fun
- gamble for the lack of other entertainment
- to much time on my hands
- Too much Free time
- like to play

- I sit at home bored out of my tree because of my inability to work so I will go gamble to try to make money for the household
- Boredom and xxx years of court proceedings for simply trying to have a bad xxxxxxx adhere to xxxxxxxx
- like the excitement of possible winning

STRESS/DEPRESSION/ESCAPE

- Major health issues and stress. Going to the casino takes your mind off of your problems for a while. But, I decided that I was going too often and so I have now cut back. Also I find that in the summer I travel more - once winter hits I don't like to drive so far.
- Use it as a pick me up when feeling depressed
- The loss of my son
- my wife
- Anxiety associated with uncertain outcomes in card games
- Lack of personal supports, loss of self esteem, isolation and seeking safe place to get out, avoidance of personal problems or issues
- stress, loneliness
- When my husband is being a jerk I go to casino and dont feel bad about doing so because he deserved it.My best friend is a every day gambler and sometimes she calls to ask me to go and I cant say no. My husband doesn't know I go but I get irritable when I lose lots of money say 600 dollars and he doesn't know why I'm ugly.
- the draw of hope that i might win and the thrill of winning as a high makes me want to return. It takes me away from other pains in life.
- Boredom, depression, loneliness

DENIAL OF PROBLEM

- no problem
- no problems
- no problems
- do not have problem
- Don't have a gambling problem
- Realy don't have any gambling problems

AVAILABILITY OF GAMBLING

- accessibility
- convenience of the casino
- its there

DON'T KNOW

- I do not know
- I don't know.
- I don't know.
- dont know

- Don't know
- nothing
- unknown
- I became a full-time "day trader" while attending xxxxxxxx.

ADDICTION

- addiction to slots
- Addiction runs in the family. I also like to play games whether for money or not.
- mentaly predissposed to gambling
- not enough self control

LOSING OR LACK OF MONEY

- excessive cost to gamble, casino profits are far too much.
- Too much betting
- The lure of easy money. In the first year of intermittent gambling at Kawartha Downs it seemed I couldn't lose...always winning jackpot after jackpot. Year two, intermittent jackpots. Year three...no jackpots...but the LURE was there and because of winning jackpots in the beginning I kept going. Then the jackpots dried up for a good dozen of people I had been playing alonside on the same machines. All of a sudden NOBODY WAS WINNING...only NEW GAMBLERS were winning. Rumors abounded! It was all a casino's plot...regardless, I got the message and haven't gone to Kawartha Downs since xxxxxxx. Seems rigged.
- stayed at it too long

SOCIAL

- following friends who gamble a lot and slowly getting hooked ourselves (myself and husband) who had too much time on his hand when he was forced into early retirement in xxxxxxxxxxx. He could not find work so he started gambling with friends. I started going with him more often when I was forced to retire in xxxxxxxxxxx. We both got hooked and went 3-4 times a week and slowly got into debt and finally filed for bankruptcy... A lot of stress and worries and still don't know what is going to happen come xxxxxxx as to whether or not the bank will renew our mortgage...but we are taking things one step at a time...it's all we can do for now. This has hurt my family a lot and I'm ashamed to let my children know the whole truth about why we filed for bankruptcy. I'm sure they know and because money is so tight, I don't get to see them ....because we live too far away and gas is expenisve...so yes, this has hurt and destroyed my family life and I wish I could turn back the clock. We continue to struggle, but we will be OK. We are strong people and will get through this somehow.

CHASING

- spending extra time at the casino trying to win my money back

OTHER

- I very often win, I know realistically that I can't win all the time, but I win more than my fair share which encourages more gambling.
- prolines
- the possibility of the quick response as to whether you win or lose
- working at a place selling tickets and lottory i get a rush seeing peaple win and think i can do that