The Relationship of Gambling to Health, Social Functioning, and Life Satisfaction in Older Adults

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Abstract

The health, social functioning, and life satisfaction of older adults, age 50 and older were explored across levels of gambling activity as measured by the National Opinion Research Centre DSM Screen for Gambling Problems (NODS). Three hundred and nine participants were recruited from two different geographic locations in Ontario. Self-rated measures consisted of two widely-used gambling screens, and measures of general health, mental health, social functioning, and life satisfaction. Alcohol consumption, the use of prescription medication, and pain were also assessed. Both recreational gamblers and non-gamblers reported significantly better health and greater life satisfaction than problem gamblers. Problem gamblers reported significantly higher anxiety and depression than both of the other groups and poorer social functioning. Higher gambling expenditures, more frequent gambling, and participation in more types of gambling activities were associated with problem gambling. Sex differences were noted in gambling activities and certain problem gambling behaviours. Residing in a household with others that gambled and not having a current marital partner emerged as predictors of problem gambling risk. The findings provide further support for the relationship between problem gambling and poorer health.

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The Relationship of Gambling to Health, Social Functioning, and Life Satisfaction in Older Adults

Gambling is a culturally defined and socially managed form of risk taking behaviour (Abt & McGurrin, 1992). Gambling involves risking money or something of value on the outcome of a chance or unpredictable event in the hope of winning something of greater value (Walker & Phil, 1992). The anticipation of a reward can make this activity exciting for many people. Some view gambling as harmless entertainment while others view it as an activity that exploits those with an addiction (Azmier, Kelley, & Todosichuk, 2001). In spite of this, gambling has emerged as a socially accepted form of leisure (Eadington, 2003*)* whose popularity cuts across race, class, and culture (Griffiths, 2006; Griffiths & Delfabbro, 2001). Gambling can take many forms, such as the purchase of lottery tickets, scratch tickets, or pull tabs, charity raffles, playing bingo, slot machines or other casino games, and betting on the horses or sports games. The tangible rewards involve the money or prize while intangible rewards may be associated with the social benefits. Although the probabilities of winning are small, individuals are vicariously reinforced by seeing people in the media who win (Korn & Shaffer, 1999).

Legalized gambling has become increasingly prominent within the last twenty years, showing an unprecedented growth (Abbott, Volberg, & Ronnberg, 2004; Blaszczynski, Ladouceur, & Shaffer, 2004; Ladouceur, Jacques, Ferland, & Giroux, 1999; Shaffer, Hall, & Vander Bilt, 1999; Wynne & Shaffer, 2003). There have been dramatic increases in the types of gambling available and in the locations where gambling is accessible (Korn & Shaffer, 1999). Opportunity theory suggests that the occurrence of behaviour is determined in part by the existence of opportunities; more

opportunities lead to increases in behaviour. This principle has been applied to gambling behaviour (Campbell & Lester, 1999). The widespread growth in gambling in North America has been attributed to opportunity created by the increased availability and accessibility of gambling activities (Shaffer et al., 1999; Shaffer & Korn, 2002), social acceptability of gambling (Desai, Maciejewski, Dausey, Caldarone, & Potenza, 2004; Griffiths, 2006), new technologies and forms of gambling (Tavares et al., 2003), and the government‟s economic needs and desire to identify new sources of revenue without initiating new or higher taxes (Korn, 2000; Korn & Shaffer, 1999).

This recent and rapid surge in the gambling industry has resulted in substantial increases in gambling revenue. Americans now spend more on gambling than they spend on movie tickets, recorded and live music, theme parks, spectator sports, and video games combined (Volberg, 2002). Frequently endorsed lifetime gambling activities include lottery tickets, scratch tickets, and slot machines, followed by playing cards and bingo for money (Marshall & Wynne, 2003; Morasco, vom Eigen, & Petry, 2006). Interestingly, poker has recently emerged as a significant ratings‟ winner for television networks (Azmier, 2005).

Gambling Behaviour

Historically, research has expressed gambling behaviours in arbitrary categories within a continuum ranging from no gambling to a great deal of gambling. These commonly defined categories have been identified as non-gambling, recreational or social gambling, problem gambling, and pathological gambling (Griffiths, 2006).

The current *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*; APA, 2000) defines pathological gambling as a discrete category; the disorder is either present

or absent. There has been considerable debate concerning this diagnostic approach and whether gambling behaviours should be conceptualized on a continuous index (Petry, 2003; Toce-Gerstein, Gerstein, & Volberg, 2003). Recent evidence by Toce-Gerstein et al. provides empirical support for a continuum with gambling symptoms graded by their severity to represent more or less severe forms of this disorder. Strong and Kahler (2007) found that the ten problem gambling symptoms in the *DSM*-IV maintained a reliable ordering across a broad range of the problem gambling continuum, and could be used to create an additive index of problem severity with sufficient reliability to identify pathological gamblers using the current diagnostic threshold of five or more symptoms.

For this research, it would be most useful to look at the conceptualization of established categories of gambling that correspond to the majority of the prior research.

Recreational gambling. For the majority of individuals, gambling remains a popular and acceptable social activity and form of recreation where problems do not develop (Bland, Newman, Orn, & Stebelsky, 1993; Shaffer et al., 1999).

Problem gambling. For some, difficulties emerge that can lead to negative consequences and the capacity to create problems (Blaszcznyski, 2000; Parke, Griffiths, & Irwing, 2004). Individuals with mild to moderate difficulties in aspects of their daily lives are termed problem gamblers (Morasco, vom Eigen, et al., 2006). Problem gambling describes harmful patterns of gambling behaviour associated with negative consequences that are not as severe as pathological gambling (Blaszczynski et al., 2004; Griffiths, 2003; Raylu & Oei, 2002; Ricketts & Macaskill, 2003) and do not meet the formal diagnostic criteria (Shaffer et al., 1999; Welte, Barnes, Wieczorek, Tidwell, &

Parker, 2001). The negative consequences are accompanied by impaired control that differs from normal healthy behaviour (Blaszczynski & Nower, 2002).

Because gambling involves excitement, risk-taking, and the possibility of monetary gains, some researchers have suggested that anyone who gambles has the potential to develop into a problem gambler (Griffiths, 2006; Shaffer et al., 1999). Lesieur (1984) proposed that a preoccupation with winning money and chasing losses leads to the development of problem gambling. The cognitive regret of losing money motivates them to continue (Wood & Griffiths, 2007). Griffiths (1999) suggests that more gambling opportunities lead to more gambling and ultimately more problem gambling behaviour.

Pathological gambling. The most severe disordered gambling behaviour has been referred to as pathological. Pathological gamblers continue gambling despite serious negative consequences that often involve financial losses, disruptions in relationships and employment, legal problems, and comorbidity with psychiatric disorders and medical conditions. The essential feature of pathological gambling is recurrent maladaptive gambling behaviour (Korn, 2000). Pathological gambling was introduced as a psychiatric disorder of impulse control in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM*-III) *i*n 1980 (American Psychiatric Association (APA). The most recent edition of the *Diagnostic and Statistical Manual of Mental Disorders*-IV-TR (*DSM*-IV-TR; APA, 2000) characterizes pathological gambling as persistent maladaptive behaviour involving a preoccupation with or a loss of control over gambling and deception about the extent of involvement. Pathological gambling criteria include (1) being preoccupied with gambling (e.g., spending considerable time reminiscing about

past gambling experiences, planning the next gambling venture, or thinking about ways to obtain gambling money); (2) having to gamble with increasing amounts of money in order to achieve the same level of excitement; (3) repeated unsuccessful efforts to control, cut back, or stop gambling; (4) becoming irritable when trying to stop or cut back on gambling; (5) using gambling to escape from problems or to relieve a mood; (6) gambling to make up for recent losses (i.e., chasing losses); (7) lying to conceal the extent of gambling activities; (8) committing illegal acts such as forgery, fraud, or theft to finance gambling; (9) risking or losing a relationship, job, or educational opportunity because of gambling; and (10) relying on others to provide money to relieve a desperate financial situation caused by gambling. A clinical diagnosis is established when an individual meets five or more of these criteria over the course of his or her lifetime. The diagnosis is not made if the gambling behaviour can be attributed to a manic episode.

Both problem and pathological gamblers‟ problems may include spending more time or money than intended, borrowing to gamble, and guilt about gambling (Shaffer et al., 1999).

Public Health Approach to Gambling: A Health Framework

A public health approach to gambling considers both the costs and benefits associated with gambling and proposes an alternative conceptualization involving healthy and unhealthy gambling (Korn & Shaffer, 1999; Korn, Gibbons, & Azmier, 2003).

Healthy versus unhealthy gambling. Healthy gambling involves a pleasurable experience with low risk, sensible wagers, and informed choice about the probability of winning. Healthy gambling has the potential to sustain or enhance a gambler‟s well being (Korn & Shaffer, 1999). Although the novelty and the excitement of the games are fun

(Loroz, 2004), healthy gamblers do not bet more than they can afford to lose because they recognize that their chances of winning are slim. Over a period of time, this may progress to unhealthy gambling and a variety of problems resulting in adverse consequences (Korn et al., 2003; Korn & Shaffer, 1999) and disordered gambling behaviour. This disordered behaviour has been described as problem or pathological depending on the severity of the problems (Blaszczynski et al., 2004). Korn and Shaffer (1999) have suggested that to prevent gambling-related problems and promote responsible gambling, healthy gambling guidelines could be developed to assist individuals in modifying their gambling behaviour.

Gambling Prevalence

As the availability of gambling opportunities has increased and become more socially acceptable, gambling participation in the general population has increased (Bondolfi & Ladouceur, 2001; Griffiths & Delfabbro, 2001; Maclin, Dixon, & Hayes, 1999; Raylu & Oei, 2002; Shaffer et al., 1999). Between 1975 and 1999, the prevalence of adult lifetime gambling in the United States increased from 67% to 85%. The 65 and older age group experienced the most dramatic increase from 35% to 80% (Gerstein et al., 1999). Welte et al. (2001) found that over 80% of Americans admitted to gambling in the past year. Further increases in prevalence are expected at an accelerated rate due to cohort effects that are reflected in the increase in social acceptance of gambling among younger age groups and greater gambling participation (Hope & Havir, 2002).

Prevalence data demonstrate an increasing trend of problem and pathological gambling. Research has shown that increases in (i) gambling availability (Abbot, Volberg, et al., 2004; Cox, Yu, Afifi, & Ladouceur., 2005; Griffiths, 1999; Griffiths,

2006; Ladouceur, 1996; Shaffer et al., 1999; Volberg, 1994), and (ii) acceptance and accessibility of gambling activities (Griffiths, 2006; Ladouceur et al., 1999; Lester, 1994; Shaffer et al., 1999; Volberg, 1994) have been associated with increases in problem and pathological gambling behaviour. Grun and McKeigue (2000) demonstrated that increased gambling opportunities led to increases in the prevalence of excessive gambling and a four-fold increase in the proportion of families spending more than 10% of their income on gambling activities. Gerstein et al. (1999) suggest that the availability of a casino within 50 miles doubles the prevalence rates of problem and pathological gamblers.

In the United States and Canada, estimates of current prevalence rates for pathological gambling range from 1-2% of the adult population (Beaudoin & Cox, 1999; Gerstein et al., 1999; Ladouceur, 1996; Shaffer et al., 1999; Volberg, 1994; Welte et al., 2001). An additional 1.3% - 3.6% report symptoms of problem gambling (Gerstein et al., 1999; Petry, Stinson, & Grant, 2005; Shaffer et al., 1999; Welte et al., 2001).

In a meta-analysis of 119 prevalence studies, Shaffer et al. (1999) found current and lifetime prevalence rates for pathological gambling in adults to be 1.1% and 1.6% respectively. Other studies have estimated higher prevalence rates. Variations in prevalence may reflect differences in gambling opportunities.

Welte et al. (2001) discovered that in addition to higher prevalence rates, problem and pathological gambling prevalence varied depending on the measure. In a representative sample of US adults (N = 2,638), the South Oaks Gambling Screen (SOGS) produced higher rates of pathological gambling than the Diagnostic Interview Schedule (DIS). Using the SOGS, the current and lifetime prevalence for pathological

gambling was 1.9% and 4.0 % respectively. When using the DIS, the rates were 1.3% and 2% respectively. There was also a variation in the prevalence of overall problem gambling behaviour (which includes pathological). With the SOGS, the current and lifetime prevalence was 5.5% and 11.5% respectively whereas the DIS reflected rates of 3.5% and 4.8% respectively. Variations in prevalence may be due to differing sensitivity and specificity values or variations in item content that could reflect a more liberal approach in assessing problem gambling or more stringent criteria.

Demographic differences. Gambling pathology is not uniform across demographic groups (Welte et al., 2001). Regional variations and differences in demographics may account for the diversity in prevalence rates. Regional variations reflect availability, accessibility, and provincial gambling activity preferences. For example, video lottery terminals (VLTs) are permitted in bars in Manitoba but not in Ontario (Marshall & Wynne, 2003). Evidence indicates that vulnerable segments of the population, particularly those with lower socioeconomic status, may be disproportionately affected by gambling disorders (Shaffer & Korn, 2002; Welte et al., 2001).

Sex differences. Research suggests that sex differences in prevalence exist. Using gambling data from a major national survey, Blanco, Hasin, Petry, Stinson, and Grant (2006) found a higher lifetime prevalence in men for both pathological and sub-clinical pathological (problem) gambling. The prevalence rate for pathological gambling was 0.64% for men and 0.23% for women; for problem gambling, the rate was 6.79% and 3.26% respectively. This is consistent with an earlier Canadian study of residents in

Alberta that found pathological gambling was three times greater in men than in women (Bland et al., 1993).

Research by Welte et al. (2001) also suggests a higher prevalence of male problem gamblers, but no sex differences in probable pathological gambling were found. The gender gap may be narrowing with the widespread availability of gambling (Petry, 2002). Although some research has suggested that gambling problems among women surface at an older age than men (Lesieur et al.,1991), a faster progression or telescoping of gambling problems was noted among treatment-seeking women gamblers as compared to men (Tavares et al., 2003; Tavares, Zilberman, Beites, & Gentil, 2001). Women with pathological and problem gambling behaviours were also significantly more likely to have lifetime mood and anxiety disorders. Further research regarding sex differences is warranted.

Canadian Gambling Landscape

Background. The roots of gambling in Canada can be traced back over 100 years. In 1892, the Canadian government (through the Criminal Code) declared a ban on most gambling activities with the exception of horse racing. A 1969 Criminal Code amendment authorized provincial and federal governments to conduct lotteries to fund worthwhile activities such as the 1976 Olympics. In 1985, a further amendment gave the provinces exclusive control over gambling (Korn, 2000; Maclaurin & Maclaurin, 2003; Smith & Wynne, 1999). Only the provincial government can conduct gaming ventures or authorize gaming under license (Korn & Shaffer, 1999).

Since then, Canada has experienced a dramatic increase in government-owned legalized gambling (Korn, 2000), and in the availability and variety of gambling activities

(Ladouceur, 1996). A broad spectrum of gambling activities are available in every region in Canada (Azmier, 2001). By 2005, only twenty years after the provinces were given control, there were 87,000 gambling machines (slot machines and video lottery terminals), 33,000 lottery ticket centres, 60 permanent casinos, 250 race tracks and teletheatres, and 25,000 licenses to run bingos, raffles, pull-tabs, and other activities (Azmier, 2005). Gambling has become part of the Canadian culture.

The availability and accessibility of gambling activities varies from province to province. Manitoba, Saskatchewan, and Alberta have permanent casinos and high per capita concentrations of VLTs. Ontario and British Columbia have permanent casinos but no VLTs (Cox et al., 2005). Lottery and instant win (scratch) tickets, the most popular gambling activities (Marshall & Wynne, 2003) are available almost everywhere.

Gambling growth and popularity. The gambling industry in Canada has flourished as Canadians have steadily increased their wagering. Studies suggest that increases in both the rates of gambling participation and per capita expenditures on gambling are related to the expansion in gambling availability (Azmier, 2005; Marshall & Wynne, 2003).

Gambling has become a multi-billion dollar industry. The growth and popularity of gambling have proven to be extremely profitable and a major source of government revenue (Room, Turner, & Ialomiteanu, 1999), accounting for at least 3.8% of the total revenue raised by the provinces (Azmier, 2005; Stevens & Beristain, 2004). In 1997, $6.8 billion was wagered on government-run gambling activities, more than double the amount spent in 1992, with casinos and VLTs accounting for about 60% of the revenue. In 2002, an estimated 18.9 million or three-quarters of adult Canadians spent $11.3

billion on various gambling activities and generated $5.5 billion in net profit (revenues less payouts and expenses) for the provinces. This represents more than a four-fold increase from a decade earlier (Marshall, 2003). In the fiscal year 2003/04, $14.575 billion in gross gambling profits (revenues less payouts) were earned (Azmier, 2005).

Local economic development has been stimulated through gambling-related jobs and social programs have been funded with the revenue generated from the gambling expansion. Industry revenues and employment have both increased by approximately 300% in the past decade. Estimates of employment in the Canadian gambling industry range from 42,000 – 47,500 (Azmier, 2001; Marshall, 2003).

Statistics Canada reports that participation and expenditure rates generally increase with household income, however, lower-income households spend proportionately more on gambling (Marshall, 2003). In 2001, the average national gambling expenditure was $447, more than triple the amount spent in 1991. In 2002, this increased to $570. For individuals who reported living alone, men spent more than three times as much as women. The most popular gambling activities were buying lottery tickets, scratch tickets, and going to a casino (Marshall & Wynne, 2003). Research by Azmier (2005) found that the main area of gambling growth over the previous four years had been in slot machines.

Gambling in Ontario. The government of Ontario has become one of the largest owners of gambling operations in North America (Korn & Shaffer, 1999). The gambling industry in Ontario is regulated by two bodies: the Ontario Lottery and Gaming Corporation which is responsible for operation of the facilities, and the Alcohol and Gaming Commission of Ontario that regulates casino gaming and administers gaming

licenses. By 2003, there were ten casinos, six of which were charity casinos, and sixteen slot machine facilities at racetracks in operation. These casinos are referred to as "charity" because some of the proceeds are used to fund government grants to benefit non-profit and community service organizations (Azmier, 2005).

Ontario residents have access to numerous gambling opportunities. Gambling is a common activity and a large majority of Ontario adults (83%) have reported some type of gambling (Wiebe, Single, & Falkowski-Ham, 2001). A joint study by the Canadian Centre on Substance Abuse and the Responsible Gambling Council of Ontario (Wiebe et al., 2001) found that the most common gambling activities in the province of Ontario are the purchase of lottery tickets, followed by raffle and scratch tickets, and playing slot machines or VLTs. For most, gambling frequency is less than once a month. The most common reasons given for gambling were for enjoyment, watching others gamble, to win money, for the entertainment, and the opportunity to socialize. Reasons cited for casino gambling were to win money, for the excitement and fun, and to socialize.

Ontario leads the provinces in revenue from gambling. In the fiscal year 1999-2000, the Ontario gambling industry drew in over $3.3 billion and employed over 17,000 people (Azmier et al., 2001). By 2003-2004, revenue had decreased to $2.091 billion in reaction to competition from the US and weaker tourism (Azmier, 2005).

Canadian gambling prevalence. Cox et al. (2005) estimates gambling prevalence for Canadians at 76% with little interprovincial variability. Studies in several Canadian provinces suggest that between 81% and 86% of the population has gambled in the past year (Stevens & Beristain, 2004) and that the prevalence in the adult population is increasing (Korn, 2000).

Ladouceur et al. (1999) found that the proportion of gamblers in one geographic region increased considerably as did the amount of money wagered after VLTs were introduced and three casinos were opened. In 1998, research funded by the Addiction Research Foundation found that residents of Niagara Falls gambled more and experienced more gambling-related problems after the casino was built there. The proportion of residents who participated in casino gambling increased from 11% to 43% after only one year (Room et al., 1999).

Canadian problem gambling prevalence. In 2002, Statistics Canada conducted a nationwide study, the Canadian Community Health Survey (CCHS), Mental Health and Wellbeing, which assessed gambling behaviours and problems using the recently developed Canadian Problem Gambling Index (CPGI). The CPGI defines problem gambling as behaviour that creates negative consequences for the gambler, others in their social network, or the community (Ferris & Wynne, 2001). The results estimated that 1.2 million adult Canadians, or approximately 5% of the adult population, exhibit "at risk" or problem gambling behaviour. Of these, 120,000 were problem gamblers who had already suffered adverse effects from their gambling (Marshall & Wynne, 2003).

Results of the study by Wiebe et al. (2001) also suggest that 3.8% of Ontario adults, or approximately 341,000 individuals are experiencing problems related to their gambling and 9.6% are at risk for the development of gambling problems.

Motivations for Gambling Behaviour

Gambling motivations differ and many variables may contribute to the motivation for gambling behaviour. No single reason is considered sufficient to explain the etiology and maintenance of gambling behaviour (Griffiths, 2006; Griffiths & Delfabbro, 2001).

Evidence suggests that biological, psychological, cognitive, social and contextual factors, and the interaction of these factors have a role (Griffiths, 1999; Parke et al., 2004; Sharpe, 2002). Variations in motivations have been observed among people participating in the same gambling activity. In addition, motivations may change as individuals progress from social or recreational to problem gambling. A person may have initially gambled for the excitement and socialization, but as problems develop, there could be an increased preoccupation with winning money and chasing losses (Griffiths, 2006). A Canadian study by Smith and Wynne (2002) found that the primary motivations for gambling are to win money, for entertainment, and to support worthy causes.

Gambling to win back losses and to manage negative emotions are both seen as variables that differentiate problem from recreational gamblers (Ricketts & Macaskill, 2004). Griffiths (2006) suggests that the reasons for problem gambling behaviour appear to depend on the individual. Parke et al. (2004) have found that individual differences in competitiveness, low levels of deferment of gratification, and chasing losses are risk factors in the development of gambling problems. Wohl, Young, and Hart (2005, 2007) proposed that an unrealistic self-perception of personal luck could play a role in the onset and maintenance of problem gambling behaviours.

Physiological arousal has been associated with problem gambling in some studies (Carroll & Huxley, 1994; Ricketts & Macaskill, 2004; Sharpe, 2004), but not in others (Griffiths, 2006). Blaszczynski, McConaghy, and Frankova (1990) demonstrated that problem gamblers have a poor tolerance for boredom. Many pathological gamblers in treatment use gambling to alleviate dysphoric moods (Beaudoin & Cox, 1999; Specker, Carlson, Edmonson, Johnson, & Marcotte, 1996). Wood and Griffiths (2007) suggest that

problem gambling continues primarily as a means of escaping reality, avoiding problems and responsibilities, filling a void (i.e., alleviating boredom or as a social outlet), or as a distraction to block out negative thoughts and feelings. Gambling serves to alter arousal levels, either through stimulation or relaxation, and provides an alternate method of coping, so is relied on and repeated. This supports earlier findings indicating that gambling is used as an emotion-focused coping strategy (Gupta & Deverensky, 2001; Nower, Deverensky, & Gupta, 2004; Wood, Gupta, Deverensky, & Griffiths, 2004) to manage emotions (Rickets & Macaskill, 2003).

Research supports a relationship between problem gambling and certain personality characteristics, such as sensation-seeking and impulsivity (Raylue & Oei, 2002), although Parke et al. (2004) did not find sensation-seeking to be a significant predictor of problem gambling behaviour. Sensation-seeking may be related to the arousal hypothesis of gambling which suggests that gambling stimuli provide excitement and arousal. Impulsivity can be defined as spontaneous behaviour where a person acts with little thought or control. Steel and Blaszczynski (1996) have found an association between gambling and high levels of impulsivity in some individuals. There is also some evidence of an association with certain personality disorders. Antisocial personality disorder, narcissistic personality disorder, and attention-deficit hyperactive disorder (ADHD) have been linked to problem gambling (Raylu & Oei, 2002). The incidence of cross-addictions in pathological gamblers might suggest the existence of an addictive personality (Griffiths, 2006).

Numerous studies suggest that cognitive distortions or biased and irrational beliefs about gambling outcomes and probabilities influence gambling decisions and

contribute to problem gambling behaviours (Behnsain, Taillefer, & Ladouceur, 2004: Griffiths, 1990; Griffiths, 2006; Griffiths & Delfabbro, 2001; Joukhador, Blaszczynski, & Maccallum, 2004; Sharpe, 2002; Toneatto, Blitz-Miller, Calderwood, Dragonette, & Tsanos, 1997). Common distortions include illusions of control, misunderstanding probabilities, near wins, over-estimating wins, and confirmation biases. An illusion of control exists when gamblers perceive that their actions have an influence on gambling outcomes and can increase the probability of winning (Hill & Williamson, 1998; Rogers, 1998). Strategies used may include the reliance on "lucky" numbers or objects, superstitious behaviours or rituals, and an exaggerated self-confidence in gambling ability (Toneatto et al., 1997). Misunderstanding probabilities regarding the randomness of winning has been identified as a key factor in maintaining gambling behaviour (Benhsain et al., 2004). Near-wins have been described as failures that are close to being successful (Cote, Caron, Aubert, Desrochers, & Ladouceur, 2003). When gambling wins appear close, the physiological arousal and the associated excitement may increase the expectancy of winning and reinforce gambling behaviour (Delfabbro & Winefield, 1999; Griffiths, 1990). Over-estimating wins can result from a memory bias with the tendency to remember more salient events (i.e., wins) than less salient events (i.e., losses) when accessing memory (Hill & Williamson, 1998). Confirmation bias involves selective recall for confirming evidence rather than disconfirming information.

Blaszczynski and Nower (2002) provide an alternative conceptual-pathway model of pathological gambling that identifies three main subgroups of pathological gamblers, each with a different pathway. Although each group is influenced by different factors, availability and accessibility of gambling facilities are common to all three. The first

group involves behaviourally conditioned problem gamblers who gamble excessively because of poor judgment. Premorbid psychopathology is absent. Problem gambling behaviours (e.g., chasing losses, preoccupation with gambling) and psychological problems (e.g., depression, anxiety, substance abuse) are viewed as a consequence, not the cause of their excessive gambling. The second group involves emotionally vulnerable problem gamblers who may display higher levels of pre-morbid psychopathology and use gambling to dissociate from unpleasant feelings and to relieve or regulate aversive mood states such as anxiety or depression. Gambling is essentially a form of psychological dependence for these individuals and is used to modify affective states. The third group has biological vulnerabilities, either through dysfunctional neurological structures or dysregulation of neurotransmitters. They are characterized by multiple maladaptive behaviours such as impulsivity and attention deficits as well as personality factors that may predispose them to excessive gambling (Griffiths, 2006; Steel & Blaszczynski, 1996) and a tendency to gamble in binges. They are likely to display other problems which include substance abuse, poor relationship skills, sensation seeking, and criminal acts (Woods & Griffiths, 2007). The pathways model is open to empirical testing (Blaszczynski & Nower, 2002).

Factors that Increase the Risk for Developing Gambling Problems

Gambling-related problems appear in all age groups and income and education levels. A number of individual and social factors can increase the risk of developing gambling problems (Blasczynski & Nower, 2002; Griffiths & Delfabbro, 2001; Raylu & Oei, 2002). Statistics Canada suggests that those at the greatest risk are males, those with less formal education, Aboriginal persons, individuals who play VLTs, and persons who

gamble frequently (Marshall & Wynne 2003). Wiebe et al. (2001) found a strong relationship between gender, age, and gambling problems with young males between the ages of 18 to 24 most likely to experience gambling problems. Of older adults aged 60 or more, 2.1% experienced gambling problems.

Clarke et al. (2006) found a high rate of probable pathological gambling in older age groups (40 years or older). However, Currie et al. (2006) determined that risk factors increased with gambling frequency and money invested and was independent of gender and age. Binde (2007) suggests that the increased availability of gambling coupled with biased gambling advertising increases the risk. Lester (1994) found a correlation between the availability of certain types of gambling and problem gamblers.

Wiebe et al. (2001) found that as the frequency of gambling increases, the likelihood of experiencing gambling problems increases. The two most common gambling activities among those experiencing problems were playing lottery tickets and slot machines. Severe problem gamblers were most likely to gamble at casinos and to report committing a crime to support their gambling.

Various studies have shown that participating in more gambling activities with greater amounts of money and engaging in continuous activities (e.g., slot machines, racing) where rapid wagers are made in short time intervals are more likely to be associated with problem gambling (Clarke et al., 2006; Griffiths, 1999; Griffiths, 2006).

A growing body of research suggests that problem gambling is familial (Eisen et al., 1998; Sharpe, 2002) and that first degree relatives are at increased risk for pathological gambling, mood disorders, and antisocial personality disorder (Black, Monahan, Temkit, & Shaw, 2006). Slutske et al. (2001) estimated that about half the risk

for pathological gambling was due to genetic factors and that common genetic risk factors exist for pathological gambling and alcohol dependence. Personality trait theorists propose that certain underlying personality traits increase the risk (Lesieur & Rosenthal, 1991).

Relationship of Gambling to Health and Well-Being

Gambling affects the emotional, physical, and social dimensions of a person"s health and can have adverse consequences or potential benefits in health and social functioning. The recent and rapid expansion in gambling and increased availability of gambling opportunities has led to questions about the potential effects of gambling on health and well-being (Korn & Shaffer, 1999). A public health concept recognizes that gambling has potential costs and benefits, which can result in healthy or unhealthy gambling. By understanding the relationship between gambling and health, the negative results can be minimized and the benefits appreciated (Korn & Shaffer, 1999). The potential impacts have only recently been examined in the literature and debates have emerged about the consequences and benefits of gambling (Korn, 2000).

Potential Adverse Consequences

Excessive gambling has been associated with a number of serious health consequences and psychosocial difficulties (Morasco, Pietrzak, et al., 2006; Morasco, vom Eigen, et al., 2006; Newman & Thompson, 2003). These include psychiatric comorbidity, family violence and dysfunction (Bland et al., 1993), significant financial problems (Gerstein et al., 1999; Ladouceur, Boisvert, Pepin, Loranger, & Sylvain, 1994; Lesieur, 1998), and criminal behaviour (Gerstein et al., 1999).

Psychiatric comorbidity. Disordered gambling has been associated with high rates of a wide range of various mental disorders (Bland et al., 1993; Cunningham-Williams, Cottler, Comptom, & Spitznagel, 1998; Ibanez et al., 2001; Linden, Pope, & Jonas, 1986; Scherrer et al., 2005; Specker et al., 1996). According to the *DSM*-IV-TR, "increased rates of Mood Disorders, Attention-Deficit Hyperactivity Disorder, Substance Abuse or Dependence, and Antisocial, Narcissistic, and Borderline Personality Disorders have been reported in individuals with Pathological Gambling" and that they "may be prone to developing general medical conditions that are associated with stress" (p. 672). Strong patterns of comorbidity have been found with alcohol abuse and dependence, major depressive disorder and dysthymia (Shaffer & Korn, 2002), phobic disorder and generalized anxiety disorder (Black & Moyer, 1998; Black, Moyer, & Schlosser, 2003: Shaffer & Korn, 2002), and suicidal ideation and attempts (Bland et al., 1993; Crockford & el-Guebaly, 1998; Newman & Thompson, 2003; Shaffer & Korn, 2002; Volberg, 2002).

Between 25% and 63% of pathological gamblers have been reported to meet the criteria for a substance use disorder in their lifetime (Crockford & el-Guebaly, 1998) with alcohol being the most commonly abused substance (Shaffer & Korn, 2002). Ibanez et al. (2001) found that significantly more men than women had current comorbid alcohol abuse or dependency. Interestingly, both gambling and alcohol are legal, heavily marketed, and highly regulated.

Earlier studies suggest that three quarters of problem gamblers display symptoms of depression (Blaszczynski & McConaghy, 1988; Linden et al., 1986). Ninety-two percent of a sample of problem gamblers in treatment in Minnesota met criteria for at

least one lifetime Axis I disorder with 54% of the diagnoses being current (Specker et al., 1996). About 18% of individuals in Canada with gambling problems acknowledged that they had contemplated suicide in the year prior (Marshall & Wynne, 2003). Approximately 6% of severe problem gamblers in Ontario have considered suicide (Wiebe et al., 2001).

Bland et al. (1993) found that every psychiatric disorder surveyed had a higher prevalence in gamblers than in non-gamblers. The highest prevalence was in substance use disorders, affective disorders, and anxiety disorders. Scherrer et al. (2005) found alcohol, drug dependence, and psychiatric disorders increased in prevalence from non-problem gambling to problem gambling to pathological gambling. A review of published papers on mood and gambling disorders revealed a high prevalence of manic and depressive disorders in comparison to the general population (Kim, Grant, Eckert, Faris, & Hartman, 2006).

Black et al. (2006) found psychiatric disorders to be more frequent among relatives of pathological gamblers. Linden et al. (1986) reported a high risk of morbidity for major mood disorders and alcohol abuse among first degree relatives.

Although some of the research indicates that pathological gamblers exhibit high rates of personality disorders comparable to general psychiatric populations (Blaszczynski et al., 1990; Blaszczynski & Steel, 1998), earlier findings by Specker et al. (1996) did not support high rates of Axis II personality disorders.

Association with poor health. As pathological gambling has been associated with a number of stressors (Shaffer & Korn, 2002), physical and mental disorders that are affected by stress, such as heart disease, gastrointestinal problems, and mood and anxiety

disorders may develop (Morasco, vom Eigen, et al., 2006). Volberg (2002) found an association between problem gambling behaviour and stress-related physical illness. In a study of adults presenting to a medical clinic, Morasco, vom Eigen, et al. found that gambling severity was associated with decreased health functioning. Pathological and problem gamblers reported more health-related concerns than recreational gamblers, who reported poorer heath than non-gamblers.

Using a National Epidemiologic survey, Morasco, Pietrzak, et al. (2006) provided empirical support for an association between gambling severity and general medical conditions. Increased gambling severity was associated with obesity, alcohol abuse or dependence, nicotine dependence, and hypertension. A lifetime diagnosis of pathologic gambling was associated with several medical disorders (i.e., tachycardia, angina, cirrhosis, and other liver disease) and increased medical utilization with problem and pathologic gamblers more likely to have been treated in the emergency room in the year prior to their study. The findings concur with most of the prior research (Erickson, Molina, Ladd, Pietrzak, & Petry, 2005; Pietrzak, Molina, Ladd, Kerins, & Petry, 2005; Scherrer et al., 2005) which has consistently shown an association between gambling severity and lower appraisals of health functioning.

In a Canadian study, Wiebe et al. (2001) found that problem gamblers are more likely to report poorer physical and emotional health. Alcohol and drug problems were also more common. In the CCHS study by Statistics Canada, problem gamblers were twice as likely to report fair or poor health (Marshall & Wynne, 2003). Compared with non-problem gamblers, those with gambling problems had higher rates of alcohol dependence and psychological distress. Since the early 1990s, the Canadian Public

Health Association has been interested in assessing the health impact of gambling behaviour (Korn, 2000). Although most of the research supports a relationship between health status and gambling severity, whether poor health precedes gambling involvement or occurs as a result of gambling activity is uncertain (Morasco, Pietrzak, et al., 2006; Shaffer & Korn, 2002). There is evidence to suggest a decline in problem gambling with an increase in socioeconomic status (Welte et al., 2001).

Quality of life. Concern has been expressed about the impact of expanded gambling on quality of life (Korn, 2000). Two studies have found significant impairments in health-related quality of life in problem and pathological gamblers (Black et al., 2003; Scherrer et al., 2005).

Social impact. Excessive gambling can also lead to social problems. Half of all problem gamblers studied by Wiebe et al. (2001) reported difficulties in relationships with family and friends. Elevated stress levels were reported as a result of the gambling pressures created.

When a problem gambler‟s behaviour affects other people, social costs often result (Azmier et al., 2001). Research into the social impact of gambling suggests that the costs can be large for both individuals and society (Griffiths, 2003). Some of the social costs cited include lost income, decreased productivity, employment absences due to stress-related depression and illness, financial problems, a strain on public services, family break-up, and divorce (Eadington, 2003; Walker & Barnett, 1999).

Potential Benefits

The dominant health focus in most of the gambling literature has been on poorer health and the social consequences of disordered gambling (Ladouceur et al., 1994;

Lesieur, 1998) with little attention given to the potential benefits of recreational gambling.

Health Gains. For the most part, the study of gambling behaviour has overlooked the possibility of health gains associated with gambling (Shaffer & Korn, 2002). The possibility of health benefits were not considered until Korn & Shaffer (1999) introduced the idea of healthy gambling. In addition to the fun, excitement, and entertainment, gambling can enhance coping strategies through recreational diversion. Korn and Shaffer suggest that gambling activities may build skills and competencies such as memory enhancement, concentration, problem solving through game tactics, and hand-to-eye co-ordination. Certain gambling activities may also be associated with the ability to manage stress which can affect a person‟s vulnerability to disease.

As leisure-time entertainment, gambling also provides socialization and a sense of connectedness and social support which can have important health benefits, particularly for older adults (Korn et al., 2003; Korn & Shaffer, 1999).

Societal impact. Gambling can provide social and economic benefits for families and communities (Korn, 2000). Gambling revenue can lessen the pressure on government to raise funds through taxation. The casinos may act as a catalyst to stimulate economic development and increased employment through the creation of jobs. Contributions from the gambling revenues are used to strengthen community capacity and support a variety of local programs, such as charities, non-profit, and community service agencies (Korn & Shaffer, 1999).

Older Adults

Older adults represent a significant proportion of the population and are one of the largest-growing segments. According to the 2006 census, the 65 and older population is approximately 4.34 million representing a record 13.7% of the total population. The number of older adults aged 55 to 64 represents 11.7% of the population, or close to 3.7 million, and has never been so high. In Ontario, 1.649 million people are aged 65 and older. The Thunder Bay District has approximately 22,615 in this age category with an additional 18,220 in the 55-64 age group (Statistics Canada, 2006).

The "Golden Years"

The so called "Golden Years" can be accompanied by a variety of health problems, numerous limitations, physical decline, situational constraints, and increased dependency on others (Manfredi & Pickett, 1987). For some individuals, the process of aging and adjusting to changes can be difficult (Torres & Hammarstrom, 2006), particularly since our youth-oriented culture places a high value on the attributes of the young, such as strength, beauty, and energy, and devalues characteristics of older persons (Gove, Ortega, & Style, 1989). Stressful events are frequent in older adults (Alexopoulos, 2001) and can involve the loss of capacities, close ties, and social contacts (Ormel, Oldehinkel, & Brilman, 2001). The prospect of death is also present.

Satisfaction with Life

Satisfaction with quality of life is a core component of subjective well-being and a measure of psychological health (Pavot & Diener, 2008). Individuals assess life satisfaction by comparing their present life situation to a desired life situation (Ferring et al., 2004). Although life satisfaction is generally assumed to decline in older age due to

deteriorating health and the social and psychological losses experienced (Chen, 2001), research findings in the gerontological literature vary on the relationship between age and life satisfaction.

Although Gove et al. (1989) presumed old age to be associated with lower life-satisfaction, lower self-esteem, and a higher level of meaninglessness, these researchers found no decline in life-satisfaction or self-esteem with age, and no increase in meaninglessness. Given that their study was based on research from over 30 years ago, there may have been a period effect as all of the older adults would have been affected by the Great Depression. Using longitudinal data to examine male adaptation to retirement, George and Maddox (1977) found general life satisfaction to be stable over time.

Factors associated with life satisfaction were examined in studies with older populations. Using a representative sample from six European countries, Ferring et al. (2004) found a decrease in ratings of general life satisfaction across age groups from age 50-90 along with age-related differences in subjective health. Deterioration in health may have contributed to the decreased life satisfaction. Using data from a Swedish twin study, Berg, Hassing, McClearn, and Johansson (2006) concluded that an individual‟s subjective assessment of health had a moderate effect on life satisfaction. After controlling for health, age had no impact on life satisfaction.

Chen‟s (2001) study on aging and life satisfaction in the elderly suggests that age and cohort experiences have a bearing on life satisfaction. Generally there was a decline in life satisfaction as age increased. Health deterioration was not a significant factor in life satisfaction. In contrast, research with a sample of older Canadian adults reported that age had a positive effect on life satisfaction and well-being after controlling for other

variables (Bourque, Pushkar, Bonneville, & Beland, 2005). Perhaps the diverse findings in the referenced studies were due to the influence of contextual factors not measured, more enduring attitudes or personality traits, or a combination of both.

Leisure Activities

Today"s older adults have been described as "life seekers" (McNeilly & Burke, 2001) who are generally more active, energetic, and involved (Hope & Havir, 2002) and who appear to place great value on having an active lifestyle. Medical advances and lifestyle changes are adding life to the years, as well as more years to life (Fries, 1980). Higher incomes and new attitudes toward aging may result in more active recreational and leisure activities. People"s capacity to adjust to the adversities of aging and their attitudes towards aging and age-related changes can affect the nature and frequency of the social activities that are chosen (Atchley & Barusch, 2004). The types of activities chosen also may be influenced by physical capacity, religious beliefs, socioeconomic status, and availability of transportation.

Gambling as a Leisure Activity

What impact has the growth and availability of gambling had on the choice of leisure activities in older adults? A study in Manitoba found that in a sample of 1000, gambling was a common activity among adults 60 years of age and older with approximately three-quarters of the respondents having gambled once in the year prior (Wiebe & Cox, 2005). In a recent large study that examined the gambling behaviour of more than 6000 older adults, McNeilly and Burke (2001) reported that gambling ranked the highest among all social activities and that 16% participated in day trips to local casinos on more than a monthly basis.

By observation, it is apparent that a large number of casino patrons are older adults. Casino gambling has become a popular recreational and social activity among aging consumers (Loroz, 2004; McNeilly & Burke, 2000).

Although a greater portion of the population is turning retirement age during a time of unparalleled availability and social acceptance of gambling (McNeilly & Burke, 2001), the published research on gambling in older adults is limited (McNeilly & Burke, 2000). This may be due to the fact that gambling in older adults has largely been viewed as a popular recreational activity (Loroz, 2004; McNeilly & Burke, 2000*)* and a harmless form of socialization and entertainment (McNeilly & Burke, 2002). The few studies that have investigated this area confirm that increasing numbers of older adults spend their leisure time gambling in casinos (McNeilly & Burke, 2001; McNeilly & Burke, 2002).

The gambling industry is aggressively marketing gambling to older adults (Nixon, Solowoniuk, Hagen, & Williams, 2005). Casinos are seeking out this segment of the population with senior-friendly promotions, inducements, and incentives because they are viewed as reliable spenders that have the leisure time and disposable income to gamble (Higgins, 2005; McNeilly & Burke, 2001). In addition, many slot machines pull handles have been replaced with buttons making it easier for older adults to play and to place bets more quickly. Casinos appear to have become a seniors‟ playground with casino gambling the activity of choice as older persons are disproportionately represented at casinos (Korn et al., 2003).

Gambling Motivation in Older Adults

Why do older adults gamble and what keeps them coming back? The popularity of gambling in this age group may be due to a number of factors.

Relaxation, socialization, passing time, avoiding boredom, and taking advantage of inexpensive meals are commonly reported motivations (Hagen, Nixon, & Solowoniuk, 2005; Hope & Havir, 2002; McNeilly & Burke, 2000; McNeilly & Burke, 2001). In a small sample of pathologic gamblers over age 60, Grant, Kim, and Brown (2001) found that half reported boredom or free time as motivating factors and many did not commence gambling until they retired. Approximately 6% were motivated by thoughts of winning.

Older adults may be more motivated to gamble to compensate for losses in their social networks, as well as for support and companionship rather than for the experience of winning money (Mok & Hraba, 1991). It may fill the void for those who are lonely. The gambling outing gives the participants an opportunity to become more actively involved in life (Stitt, Giacopassi, & Nichols, 2003) and regain social contact on a regular basis in an environment that is safe. McNeilly and Burke (2001) found gambling to be the most patronized type of social activity by active senior citizens. Social interaction is an important component of life. Gerontologists promote Activity Theory, which focuses on the importance of an active lifestyle and social interaction to maintain a positive self-concept and to protect against the stress of old age (Gove et al., 1989). In a study of a small sample of older residents in Minnesota, Hope and Havir (2002) found that the majority gambled in casinos primarily for the social aspects. Those in their seventies went primarily for fun while those over eighty went for entertainment and for something to do. Similarly to the study by Grant et al. (2001), only 6.2% participated with the intent of winning.

The aging process itself may influence an individual‟s motivations for gambling (Zaranek & Chapleski, 2005). Although people are inclined to play, risk, and compete (Griffiths, 2006), aspects of aging may restrict their participation in certain activities. However, aging, health problems, and physical limitations make little difference to inclusion and participation in gambling activities as minimal physical activity is required (McNeilly & Burke, 2001).

In interviews with older gamblers, Loroz (2004) found that psychological benefits were associated with gambling and that three central factors emerged as integral components in the gambling motivations of older adults: control, lift, and escape. Gambling provides a means for them to maintain a sense of control over some aspect of their lives by making informed decisions and choices about their gambling activities, loss probabilities, and spending limits. Torres and Hammarstrom (2006) suggest that this sense of control plays an important role in their capacity to adjust to the adversities of old age and is needed to achieve a sense of well-being, satisfaction with life, and successful aging. Steverink, Westerhof, Bode, and Dittman-Kohli (2001) propose that the belief about self-efficacy and feelings of control is the most important psychological resource that a person has in coping with growing old.

Gambling and the anticipation of gambling activities can provide both physical and emotional lifts which may increase self-awareness and feelings of being alive. The casino games also provide multisensory arousal. The flashing lights, constant introduction of new slot machine games, special promotions, complementary beverages, inexpensive food, and transportation create a source of enjoyment and an atmosphere of fun (Loroz, 2004). In addition to providing pleasure, fun and excitement, gambling offers

the older participant a change from their everyday routine and active participation in a leisure activity that can be both biologically and psychologically stimulating, even if the participation is primarily solitary.

Stressful life events are part of late life and often increase with age. Gambling may be used as an escape and a method of coping with life"s problems. It provides an important diversion and improves the self-concept of older adults (Loroz, 2004). Because it provides temporary relief from everyday physical ailments and emotional pains, the gambling behaviour may be repeated. Bazargan, Bazargan, and Akanda (2000) found a correlation between certain stressful life events and gambling behaviours. Gambling may help in reducing the psychological impact of these events.

Many retired older adults are believed to have been initiated into gambling by taking advantage of the special incentives offered (McNeilly & Burke, 2002). Interestingly, an earlier study by McNeilly and Burke (2000) reported that older adults sampled from gambling venues and the community did not tend to identify casino promotions as motivation for their gambling.

A lack of alternate activities and leisure options has also been suggested as motivations for gambling in this age group (Wiebe & Cox, 2005).

Gambling Prevalence in Older Adults

Patterns of gambling in older adults have changed substantially. Although research suggests there is a negative correlation between age and gambling activities (McNeilly & Burke, 2001: Mok & Hraba, 1991), the increase in social acceptance of gambling and expansion of gambling availability has led to an increase in gambling participation among older adults (Gerstein et al., 1999; Ladd, Molina, Kerins, & Petry,

2003; Pietrzak, Morasco, Blanco, Grant, & Petry, 2007; Shaffer & Korn, 2002). Petry (2002) found that 89% of older female pathological gamblers reported that their gambling started when casinos became legalized.

A national survey in the US reported that lifetime gambling rates in older adults increased from 35% in 1975 to 80% in 1998. Past year gambling rates increased from 23% to 50% (Gerstein et al., 1999). Welte et al. (2001) found that 10.2% of US adults over the age of 60 gambled twice a week or more. Generally, prevalence rates have increased (Kausch, 2004; Korn & Shaffer, 1999), and will likely continue to increase at an accelerated rate as the overall population ages (Kausch, 2004) and as gambling participation expands in this age group (Petry, 2002).

In general population surveys, the prevalence rate of pathological gambling in older adults is usually quite low (Petry, 2002). In a nationally representative sample of adults age 60 and older, Pietrzak et al. (2007) found 28.74% were lifetime recreational gamblers and 0.85% were lifetime disordered (problem or pathological) gamblers. Other studies have reported higher rates. Research on adults age 60 and older in Manitoba suggests a pathological gambling rate of 1.2% with a higher rate of 3.8% when combined with problem gamblers (Wiebe & Cox, 2005). When McNeilly and Burke (2000) surveyed a nonrandom sample of older adults, they determined that 4.2% were problem gamblers and 2.6% were probable pathological gamblers. Erickson et al. (2005) identified 6.4% as problem gamblers and an additional 3.8% as pathological gamblers. McNeilly and Burke (2001) found that 11% of older adult gamblers were probable pathologic gamblers. Bazargan et al. (2000) found that 17% of African Americans in their study were heavy or disordered gamblers.

Actual rates could be higher because of under-reporting. Older adults may be less likely to report problem gambling behaviour (Potenza, Steinberg, Wu, Rounsaville, & O'Malley, 2006) and or seek mental health services (Stewart & Oslin, 2001). Nixon et al. (2005) found that older adults went to considerable effort to hide gambling problems from family and friends and experienced guilt and shame from concealing their gambling. Prevalence may also be higher as the gambling questionnaires that are used may not be appropriate for older adults or be sensitive to the gambling effects that older persons are likely to experience (Wiebe & Cox, 2005). For example, questions relating to lost time from work do not apply to those who are retired. In addition, older adults who have lost partners or friends may be less likely to report hiding their gambling, having money arguments about gambling, or claiming wins.

Gambling Vulnerability

With the growth of the casino industry, a growing number of older adults are gambling at casinos (Zaranek & Chapleski, 2005). For the majority of older adults, gambling can provide excitement and respite from real-life problems. There may be few alternate activities that produce any positive reinforcement (Shaffer & Kidman, 2003). For others, particularly those that are vulnerable to the changes and losses that occur in aging, it can become a problematic addiction (McNeilly & Burke, 2001; McNeilly & Burke, 2002).

Although their rates of disordered gambling are lower and older persons are generally considered low risk-takers, concern has been expressed about the vulnerability of older adults to gambling-related problems (Korn & Shaffer, 1999; Nixon et al., 2005; Shaffer & Korn, 2002).

Late life changes separate older gamblers from other populations of gamblers and place them at greater risk (Korn, 2000). Their unique circumstances may increase their vulnerability to the negative effects of gambling, particularly the attraction of casino gambling (Nixon et al., 2005) which is portrayed as being exciting and safe (Zaranek & Chapleski, 2005). The major life changes could include retirement, loneliness following the death of a spouse, family member, or friend (McNeilly & Burke, 2002), free time, boredom, having a fixed income and concerns about financial security, social isolation because of lost social and community involvement (McNeilly & Burke, 2002), and anxiety from changes in health (Korn et al., 2003).

After a lifetime of fiscal caution, some have begun to take risks in late life (McNeilly & Burke, 2001). Even though they may have gambled socially for years, researchers studying elderly patients attending clinics found that 10.9% were at risk for developing a gambling disorder (Levens, Dyer, Zubritsky, Knott, & Oslin, 2005). Kausch (2004) discovered that a majority of older gamblers that were admitted to treatment were late-onset gamblers. More than 25% developed gambling problems within five years of admission to treatment and almost 50% within ten years with slot machines the most common gambling activity leading to gambling problems.

Although older adults may consider casino gambling more as a socially acceptable pastime than a risky behaviour (Abt & McGurrin, 1992), it is commonly concluded that older casino gamblers are in danger of squandering their assets and endangering their well-being (Hope & Havir, 2002).

Recent evidence also suggests that although their incomes are lower, older persons show trends towards wagering larger amounts (Petry, 2002). They often have

restricted incomes, with limited opportunity to replenish their financial losses, recover from the consequences of disordered gambling, and have a new start at life (McNeilly & Burke, 2002; Petry, 2002). If they hit bottom, they are reluctant to seek help (Nixon et al., 2005). In the future, a larger number of older adults may experience problems as each successive age cohort is being socialized into a more liberal gambling environment (Mok & Hraba, 1991; Wiebe et al., 2001).

Yet, Hope and Havir (2002) found no evidence that casino gambling is financially harmful to older gamblers. Instead, they found that older adults are less motivated to take risks for financial reasons, and the majority suffered no ill effects from their responsible gambling habits. Many of the today"s older adults were raised in families who had to struggle to make ends meet. They were taught to work hard for their money and not to waste. For the most part, these early experiences influenced their entire lives. The authors indicate that the older adults in their sample did not see themselves as vulnerable and would not risk their economic security on gambling ventures. The majority in this study set a gambling budget and adhered to it. Gambling was not problematic. Study participants did not place themselves in financial jeopardy and were aware of risky behaviours and the danger signs of problem gambling.

Relationship of Gambling to the Health and Well-Being of Older Adults

While prevalence studies have estimated the incidence of gambling in older adults, the health effects and social impact of gambling in the older population has received little attention (McNeilly & Burke, 2000; Shaffer & Korn, 2002; Welte et al., 2001). In the few studies that have explored this area, health and social functioning were related to the severity of gambling with increased gambling associated with decreased

physical and mental health functioning (Morasco, Pietrzak, et al., 2006; Morasco, vom Eigen, et al., 2006).

Associations with problem gambling. In general, both problem and pathological gambling have been associated with problems in personal and social functioning and adverse health consequences including psychiatric and medical difficulties (Black & Moyer, 1998; Gerstein et al., 1999; Pietrzak et al., 2007) and higher rates of suicidal ideation and attempts (Specker et al., 1996). Although pathological gambling is an increasing public health concern (Petry, 2002) and comorbidities between disordered gambling and a variety of psychiatric conditions have been established (Cunningham-Williams et al., 1998), limited research has investigated this association in older adults. Consequently, little is known about the psychiatric comorbidity among older adult problem and pathological gamblers (McNeilly & Burke, 2002).

In an examination of psychosocial functioning in older adult problem and pathological gamblers, psychosocial distress was associated with the severity of gambling problems (Erickson et al., 2005; Pietrzak & Petry, 2006). Older disordered gamblers reported experiencing more severe health and psychosocial problems and rated aspects of their current physical and mental health as poorer than individuals without gambling problems (Black et al., 2003; Erickson et al., 2005; Pietrzak et al., 2005; Pietrzak & Petry, 2006; Shaffer & Korn, 2002; Welte et al., 2001). Bazargan et al. (2000) found a significant association between gambling behaviours, self-perceptions of health status, and perceived control over future health. Pathological gamblers were more likely to report lower levels of perceived control over health as well as lower levels of health.

Some individuals involved with the treatment of problem gamblers have observed that increasing numbers of older adults with affective disorders are presenting with problem gambling behaviours (Glazer, 1998). Pietrzak et al. (2007*)* report that older disordered gamblers were significantly more likely to have mood, anxiety, and personality disorders, as well as alcohol and drug disorders, and past year diagnoses of arthritis or angina. This is consistent with prior research (Bland et al., 1993; Cunningham-Williams et al., 1998). Because of the elevated rates of alcohol and drug use (Gerstein et al., 1999; Welte et al., 2001), medical disorders linked with substance abuse may also occur at high rates (Morasco, Pietrzak, et al., 2006). Pietrzak et al. (2007) suggest that disordered gamblers may experience more stress and participate in less health-related activities. Petry (2002) found older pathological gamblers had less problems with family obligations, marriage, legal issues, or drugs compared to younger gamblers.

Associations with recreational gambling. Although much of the literature reflects concerns about the adverse effects of problem gambling behaviour on health, the older segment of the population may receive health benefits from their gambling activity and its impact on social connectedness (Korn et al., 2003). Few studies have examined the health associations with recreational gambling in older adults despite the growing gambling rates.

Korn and Shaffer (1999) proposed that the elderly may receive health gains from recreational gambling. Desai et al. (2004) found a differential association of gambling participation and subjective health across age groups and have suggested that recreational gambling may be associated with health benefits in older adults. However, this finding

was based on participants‟ responses to only one question regarding their general health. In a cross-sectional study of older Pennsylvanians, recreational gambling was associated with better self-rated health, greater social support, and lower depression scores (Vander Bilt, Dodge, Pandav, Shaffer, & Ganguli, 2004). Loroz (2004) suggests that certain psychological benefits of gambling may exist for older adults that enhance their self-concept and contribute to overall health in later life. Pietrzak et al. (2007) associated recreational gambling with subjective reports of better health. The more positive ratings of health could be due to increased socialization, activity, and cognitive stimulation. This would be consistent with literature on healthy aging (Vaillant & Mukamal, 2001). Contrary to prior research by Desai et al. (2004), Morasco, vom Eigen, et al. (2006) found that recreational gambling was not associated with better health. Differences in demographics and research methodology may have accounted for the different findings. It is also possible that some older adults may have limited access to transportation or be unable to gamble due to ill health, so are categorized as non-gamblers; the older gamblers would then appear to be healthier (Desai et al., 2004).

Hope and Havir (2002) found that the social benefits associated with gambling were most important. Research into the impact of social activities has found them an important factor in longevity (McNeilly & Burke, 2001). The benefit of gambling as a possible means of positive adjustment to age-related change needs to be addressed in the research (McNeilly & Burke, 2002).

Gambling has expanded at a rate well beyond the research community‟s ability to assess the effects and consequences (Azmier et al., 2001). Given the rapid expansion of gambling and the scant research in gambling in the older population, (McNeilly & Burke,

2001) further investigation of the relationship between health, social functioning, life satisfaction, and levels of gambling behaviour are warranted.

Purpose of Study

Most research assumes only the negative consequences of problem gambling. Few studies have examined the health correlates of recreational gambling. Korn and Shaffer (1999) have suggested that recreational gambling may be associated with improved health functioning. Vander Bilt et al. (2004) found that among older adults, recreational gambling was associated with better self-rated health and lower depression scores. Desai et al. (2004) reported that in contrast to younger adults, recreational gambling in older adults was not associated with adverse measures of health and wellbeing and may provide some beneficial effect. The possibility of health gains associated with recreational gambling in older adults requires further examination.

The life changes associated with aging can create a vulnerability to serious illness, depression, anxiety, and the use of alcohol and medication. This study examined the relationship of level of gambling activity to health, social functioning, and life satisfaction in a cohort of older adults. Individuals with gambling severity scores ranging from modest to scores suggesting problem and pathological gambling were compared to a non-gambling control group on self-rated measures of general and mental health. Mental health indicators included measures of depression, anxiety, and alcohol use. Medical conditions that are more prominent in older adults, pain, and the use of prescription medication were also assessed.

The primary aim of this research was to assess if health in an older population varies by level of gambling activity and to explore the possibility that better health may

be associated with recreational gambling. Overall, it was expected that the results would show (1) a relationship between gambling activity and health, (2) that participants with gambling problems would rate their health and social functioning as worse than participants without gambling problems, and (3) that recreational gamblers would report better health than non-gamblers (Hypothesis 1).

Gambling and general health. Prior research has shown an association between gambling severity and appraisals of health and wellbeing (Erickson et al., 2005; Pietrzak et al., 2005; Scherrer et al., 2005). In recent years, the notion of "healthy drinking" has evolved, with the recognition of the health benefits associated with a moderate intake of alcohol (Thun et al., 1997). Empirical research has demonstrated that in older adults, low levels of alcohol consumption can be preventative and reduce mortality due to heart disease (Ashley, Ferrence, Room, Rankin, Single, 1994; Rehm, Bondy, Sempos, & Vuong, 1997). Is it possible that a similar approach to gambling could also have health benefits for older adults? Although Desai et al. (2004) suggests recreational gambling may be associated with health benefits in an older population, there is a lack of literature comparing recreational gambling and health, so tentative predictions were made.

It was expected that the results would provide empirical support for the association between gambling severity, and health and social functioning, with problem and pathological gamblers reporting poorer appraisals of health and social functioning than non-gamblers and recreational gamblers (Hypothesis 1a). It was also anticipated that recreational gamblers would rate their general health better than non-gamblers and would be less likely to report serious medical conditions (Hypothesis 1b).

Gambling and mental health. Problem and pathological gamblers are more likely to report poorer emotional health and an increase in the prevalence of psychiatric disorders (Morasco, Pietrzak, et al., 2006; Morasco, vom Eigen, et al., 2006; Scherrer et al., 2005; Wiebe et al., 2001). Strong patterns of comorbidity have been found with depression, anxiety disorders, and alcohol abuse (Pietrzak et al., 2005; Shaffer & Korn, 2002). It was expected that the results would provide further empirical support for the association between poorer emotional health and problem gambling with older problem and pathological gamblers scoring significantly higher than non-gamblers and recreational gamblers on measures of depression and anxiety (Hypothesis 1c).

The elderly often become isolated as they age. Older adults may be motivated to gamble for social interaction or as diversion from the stresses associated with late life changes. As the benefits of gambling include social support and social integration, recreational gamblers may experience less psychological distress. It was therefore expected that older recreational gamblers would differ from non-gamblers and report lower levels of depression and anxiety (Hypothesis 1d).

Gambling and alcohol. Both gambling and alcohol are legal for adults, heavily marketed, and regulated by the government. Many consider both as a form of entertainment or a recreational pursuit (Korn & Shaffer, 1999). Earlier sections highlighted elevated alcohol use in older problem gamblers. It was expected that the results would provide additional empirical support for the association between problem and pathological gambling and higher rates of alcohol use (Hypothesis 1e). Because of the socialization provided through gambling, it was hypothesized that older recreational gamblers would be less likely to use alcohol to cope with the aging process and would

report lower rates of alcohol use than problem gamblers and non-gamblers (Hypothesis 1f).

Pain and prescription medication use. Exploratory examinations were undertaken to compare pain and the use of prescription medication with levels of gambling activity.

A second aim of this study was to investigate the degree to which gambling activity was associated with life satisfaction. Gambling participation as a leisure activity can be stimulating and provide a sense of well-being and satisfaction with life. It was hypothesized that older recreational gamblers would report higher levels of life satisfaction than both problem gamblers and non-gamblers (Hypothesis 2).

The third objective was to examine the association of gambling with demographic characteristics. The relationship of gambling variables with gambling group and with age (i.e., frequency, preferred gambling activities, and funds spent on gambling) was also investigated. Empirical evidence suggests that gambling is a popular activity for older adults. It was hypothesized that the data would reflect this (Hypothesis 3a). It was also expected that the majority of the sample in both communities would be classified as recreational or non-problem gamblers, with only a small portion reporting problem gambling behaviour (Hypothesis 3b). Sociodemographic factors such as work status (i.e., employed, unemployed, or retired), income, education, sex, marital status, ethnicity, and religious affiliation, and the relationship of these factors with gambling levels were examined. In addition, participation in other social activities was assessed (supplementary to Hypothesis 3).

The final objective of this research was to examine whether regional variations exist between the participants recruited from two different geographical areas: an urban location in southern Ontario with many gambling venues in close proximity and a more remote location in northern Ontario with two gambling venues within a 50 mile radius. Increases in availability and accessibility have been associated with increases in problem gambling behaviour in the literature. However, the availability of other leisure and social activities may also have an influence on gambling participation in older adults. In more remote areas where opportunities to participate in other activities are limited, the elderly may be drawn to gamble more despite the fact that there are fewer gambling venues. Therefore, it was hypothesized that gambling frequency in older participants from northern Ontario would be higher (Hypothesis 4a). It was also anticipated that older participants from northern Ontario would report more problematic gambling behaviour and more severe gambling problems on both measures of gambling behaviour (Hypothesis 4b). Hypotheses 1a, 1c, 1d, 1e, 2, 3a, and 3b involve extensions of previous research. Hypotheses 1b, 1f, 4a, and 4b are novel hypotheses examining associations not previously investigated.

The overall results of this research will enhance the understanding of the relationship of levels of gambling activity to health, social functioning, and life satisfaction in older adults, and determine whether any positive health and social functioning benefits can be associated with recreational gambling in this age group.

Method

Participants

Three hundred and nine participants in total were recruited between August 2008 and January 2009 from two communities in different geographic areas in Ontario that have access to casinos. Three hundred and seven of these participants were aged 50 and older. The use of the age of 50 to identify older adults is consistent with the criteria used by OLG, although other studies have used age 55 or 60 to define the older population. In Northwestern Ontario, participants were sampled from the Thunder Bay area where casino gambling is available at the government sponsored charity casino and at the Grand Portage Casino in Minnesota, located approximately 70 kilometres away. In Southern Ontario, participants were obtained from the Brantford area where casino gambling is also available locally at the charity casino. As well, other casinos within driving distance are located in Windsor, Point Edward, Orillia, and Niagara Falls. Slot machines are also available at nearby race tracks such as Woodbine, Flamboro, and London. The population in the Brantford area (124,605) is similar to the population in the Thunder Bay Census Metropolitan Area (CMA; 122,910). The proportion of residents over age 65 in each community is also comparable (18,165 vs. 19, 695 respectively) (Statistics Canada, 2006). Nine participants over the age of 50 residing outside the recruitment areas completed surveys. Excluded from the analyses was data from the two participants not meeting the age criteria (under age 50) and five cases where participants endorsed three or more infrequency items. A detailed description of participant recruitment can be found in the Procedures section.

Participants whose responses to gambling questions denied any gambling activity involving money were classified as non-gamblers. Individuals that gambled were classified according to the extent of their gambling involvement using the NODS criteria. Non-gamblers were recruited from the same locations as the gamblers. Participants were divided into one of three groups: non-gamblers (*n = 32*), recreational gamblers (*n = 180*), and those scoring in the problem or pathological range (designated "problem gamblers", *n = 26*). Those scoring in the "at risk" range (*n* = 34) were excluded from gambling group analyses. Thirty individuals did not provide sufficient data for gambling group classification. Gambling group analyses was based on 238 participants.

Participants ranged in age from 50 – 98 (*M = 66.88*; *SD = 9.52*). Females comprised 72.5% of the sample. Educational levels varied from no formal schooling to the attainment of post-graduate degrees with approximately 44.0 % of the subjects having post-secondary education. Despite the relatively high level of post-secondary education, 34.4% reported an annual income of less than $20,000. The majority of participants self-identified as Caucasian (78.8%), followed by other/mixed (4.7%), and First Nations (3.0%). Married individuals represented 39.1% of the participants and 30.1 % of the subjects indicated they were widowed. Ninety-two percent identified a religious affiliation while 23.5% indicated that their religious beliefs were not strong. Most of the sample (69.9%) was retired (see Table 1 for a summary of the main demographic characteristics for each group).

Measures

The research survey was comprised of a demographic questionnaire and several standardized instruments. These included two self-report measures of gambling

behaviour: the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987*)* and the National Opinion Research Centre (NORC) DSM Screen for Gambling Problems (NODS; Gerstein et al., 1999). Health and social functioning were measured by relevant sections of the 36-item Short-Form Health Survey (SF-36; Ware & Sherbourne, 1992), depression and anxiety by the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983), alcohol consumption by the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993), and life satisfaction by the Satisfaction with Life Scale (SWL; Diener, Emmons, Larsen, & Griffin, 1985). Questions to assess the use of prescription medication were also administered. A unique difficulty in survey assessment exists in the older adults. Factors such as fatigue and poor concentration can make it difficult to remain focused when filling out lengthy questionnaires. As a result, brief measures and short versions of scales were used.

Demographic Questionnaire. Participant demographic information developed by the author included age, sex, marital status, employment status, ethnicity, education, income, housing status, religious affiliation, and social activities (Appendix A).

South Oaks Gambling Screen. The SOGS (Lesieur & Blume, 1987) is a widely used and reliable instrument for assessing gambling problems, and allows for the classification of individuals as non-gamblers, recreational gamblers, problem gamblers, and probable pathological gamblers. It is a relatively short measure that assesses lifetime gambling behaviour (Appendix B). A score of two or less suggests no problems, a score of three to four represents problem gambling, and scores of five or more represent probable pathological gambling. The SOGS has been field-tested in a variety of clinical settings and translated into several languages (Lesieur & Blume, 1993). Although the

SOGS has received some criticism regarding high false-positive rates (Stinchfield, 2002), and its reliance on outdated criteria from the DSM-III (Cox, Enns, & Michaud, 2004), it is still the most widely used instrument to assess gambling pathology (Beaudoin & Cox, 1999) and has psychometric data related to reliability and validity in various settings (Murray, Ladouceur, & Jacques, 2005; Pasternak & Fleming, 1999). Sensitivity of .91 and specificity of .995 have been reported (Stinchfield, 2002). Internal consistency analysis yielded Chronbach‟s alpha of .97, test-retest reliability of .71, and convergent validity of .86 with an independent assessment (Lesieur & Blume, 1987). Scores on the SOGS correlate highly with scores on the DSM-based instruments for pathological gambling (Lesieur & Blume, 1987; Cox et al., 2004). Use of the SOGS permits comparisons with prior SOGS-based research.

National Opinion Research Centre (NORC) DSM Screen for Gambling Problems (NODS). New instruments to measure gambling behaviour were developed as a result of the modified criteria for pathological gambling diagnosis in the DSM-IV and the trend of the SOGS to overestimate pathological gamblers (Gerstein et al., 1999). One such measure is the NODS which was developed for the 1999 National Survey of Gambling Behaviour (Gerstein et al., 1999; Appendix C). It includes 17 questions that correspond to the 10 diagnostic criteria of the DSM-IV, with some criteria using more than one question. The maximum score that can be obtained is 10, with one point per criteria. Respondents are classified into four categories: low risk gamblers (0 criteria met; no adverse effects), at risk gamblers (1-2 criteria), problem gamblers (3-4 criteria), or pathological gamblers (5 or more criteria). This measure was designed to provide a more strict definition of disordered gambling than the SOGS (Hodgins, 2004; Lesieur &

Blume, 1987) and is thought to produce less false-positive rates (Gerstein et al., 1999). The national study that used the NODS classified fewer individuals as pathological gamblers than other studies (Shaffer et al., 1999; Welte et al., 2001). Petry (2003) suggests this may be as a result of the strict interpretation of the DSM criteria in the NODS or characteristics of the sample. Strong internal consistency, good test-retest reliability, and good validity were shown in studies carried out at the time of its development (Gerstein et al., 1999).

Short Form-36 Health Survey (SF-36). The SF-36 is a 36-item instrument designed to assess health and social functioning in both clinical practice and research settings (Ware & Sherbourne, 1992; Appendix D). This multi-item scale has proven useful in surveys of general and specific populations. The questionnaire items represent multiple indicators of health and yields an eight-scale profile of functional health and well-being scores: (1) limitations in physical activities because of health problems, (2) limitations in social activities because of physical or emotional problems, (3) limitations in usual role activities because of physical health problems, (4) bodily pain, (5) general mental health (psychological distress and well-being), (6) limitations in usual role activities because of emotional problems, (7) vitality (energy and fatigue), and (8) general health perceptions. It also provides psychometrically-based physical and mental health summary measures (Ware, 2004). Physical health is composed of general health, physical functioning, role-physical, and bodily pain subscales. Mental health is composed of mental health, vitality, social functioning, and role-emotional subscales. Higher scores reflect a more favourable health state whereas lower scores indicate more severe problems. Improvements to the layout, type size, and wording of questions were

introduced in 1996 to make it easier to read and complete. This measure is suitable for self-administration and has been widely adopted because of its brevity and comprehensiveness (Ware, 2004). The SF-36 has been validated in elderly subjects (Lyons, Perry & Littlepage, 1994). Sections pertaining to limitations in physical activities and usual role activities, and general mental health have not been included in this survey.

Alcohol Use Disorders Identification Test (AUDIT). The AUDIT was developed as part of a six-country World Health Organization collaborative study (Saunders et al., 1993). It consists of 10 items with questions in three domains that pertain to the quantity and frequency of alcohol consumption, drinking behaviour, and alcohol-related problems in the previous year (Appendix E). The responses are based on the frequency of the experience. Each response is scored from 0 to 4, with a maximum possible score of 40. Questions on this measure were selected based on reliability, validity, adequacy of coverage of relevant conceptual domains, gender appropriateness, and cross national generalizability (Allen, Litten, Fertig, & Babor, 1997; Allen, Reinert, & Volk, 2001). The test development samples yielded sensitivities generally in the 90s and specificities averaging in the 80s when using a cutoff score of 8 to detect harmful alcohol use. It has also demonstrated a high level of internal consistency (Saunders et al., 1993).

The AUDIT has been widely adopted as a screening instrument. Conigrave, Saunders, and Reznick (1995) have concluded it is a valuable tool in identifying drinkers at risk of harm from alcohol consumption and predicting alcohol-related social problems and illness. The additional strengths of the AUDIT are its brevity, focus on current

behaviour, and its likely freedom from cultural or gender bias due to the diverse nature of the test development sample (Allen et al., 2001).

When selecting an alcohol screening measure for older adults, ease of use, acceptability by the elderly, sensitivity, and specificity should be considered (O'Connell et al., 2004). Although other screens for alcohol use exist, the most widely known (ie., Michigan Alcohol Screen Test and the CAGE) are useful and sensitive in screening for advanced problems such as alcoholism but have been found less suitable at detecting less severe drinking problems. The AUDIT was designed to identify harmful alcohol use and less severe alcohol problems rather than long term dependence (Saunders et al., 1993). This can be useful for alcohol screening in the elderly as many older adults have alcohol problems even though they do not meet the criteria for alcohol abuse or alcohol dependence (Barry & Blow, 1999). Philpot et al. (2003) found that the AUDIT performed better than the CAGE in identifying problem drinking in a sample of elderly clients referred to a mental health service. Gomez et al. (2006) reported that AUDIT performed well in detecting hazardous drinkers in the elderly. Berner, Kriston, Bentele, and Harter (2007) performed a systematic review of the diagnostic accuracy of the AUDIT. In three studies with elderly clients, sensitivities ranged between .55 and .83 with an average specificity of .96.

Use of Prescription Medication. This measure developed by the author consisted of eleven statements related to the use of prescription medication for sleep, pain, mood, blood pressure, cholesterol, prostrate or hormone replacement, water retention, and the quantity of prescription medications taken (Appendix F).

Hospital Anxiety and Depression Scale (HADS). The HADS (Zigmond & Snaith, 1983) has been established as a popular and reliable self-rating measure for clinically significant anxiety and depression in medical practice (Appendix G). The measure is comprised of 14 statements relevant to either generalized anxiety or depression. Seven items are contained in each subscale. Each statement involves a choice of one of four responses with possible scores for each subscale ranging from 0 - 21. Scores of 11 or higher are indicative of the probable presence of a disorder. To overcome response bias, the order of responses has been alternated so that maximum severity (and scoring) alternates between the first and last responses. The use of the term „hospital" may suggest that its use is limited to that setting, but many studies have confirmed that is valid when used in community settings (Snaith, 2003). Research with a large population in Norway supports the psychometric properties of the HADS (Mykletun, Stordal, & Dahl, 2001).

Satisfaction with Life Scale (SWLS). Life satisfaction can be defined as a global evaluation by an individual of his or her life by a comparison to a standard that the individual has subjectively set for themselves (Diener et al., 1985). The SWLS (Appendix H) was developed as a multi-item measure of subjective well-being (Pavot, Diener, Colvin, & Sandvik, 1991). The five items on this scale have been shown to be a valid and reliable measure of global life satisfaction in a wide range of age groups including the elderly. It has been found to correlate well with other measures of subjective well-being. It is brief, yet it offers as high a predictive validity as several longer measures of life satisfaction (Diener et al., 1985; Pavot et al., 1991). Responses are scored on a 7-point scale with a range of possible scores from 5, suggesting minimal

satisfaction with life, to 35, suggesting very high satisfaction with life. A score of 20 represents a neutral point on the scale.

Procedures

Subjects were recruited from senior housing projects, senior centres (e.g., 55 Plus Centre), medical clinics, and the community at large through advertisements at participating sites and in local newspapers, and recruitment ads posted at two casinos. Recruitment attempts at the casinos resulted in only twelve study participants (3.9% of the sample).

Information tables were used at the housing projects, senior centres, and Lakehead University to distribute questionnaires and respond to questions. When contacted by phone or email, pre-paid, self-addressed and stamped envelopes were provided. The target sample was 300 older adults per community.

Participants were asked to complete the questionnaire described in the Measures section and offered a small item worth about $1 (e.g., pen) for their participation. To ensure anonymity, participants were instructed not to place their names on the survey.

The cover letter (Appendix I) explained that the purpose of the study was to explore the relationship between gambling behaviour, health, well-being, and social functioning. Informed consent (Appendix J) was obtained prior to administration of the measures and participants were provided with a written debriefing (Appendix K) and an opportunity to ask questions. Ballots with the names of the participants were entered into a draw for a $50 restaurant voucher in each community.

Ethical considerations. The research protocol was reviewed by the Psychology Department Research and Ethics Committee and by the Lakehead University Research

Ethics Board. Confidentiality and anonymity was assured verbally, in the cover letter, and in the consent form. Participant anonymity was further protected as consent forms were detached from the questionnaire immediately upon receipt and stored separately.

Analyses

Descriptive analyses were conducted and the data were screened for normality employing the procedures outlined in Tabachnik and Fidell (2001). Outliers were identified as standardized scores greater than 3.29 standard deviations above or below the mean. The analysis of the obtained data revealed skews ranging from -1.007 to 3.695 and kurtosis ranging from -.563 to 19.18. Logarithmical transformations were conducted on three of the main variables with a positive or negative skew: depression, anxiety, and use of alcohol. Logarithmical transformations were also performed on two of the gambling variables: money spent gambling in a four week period (skew = 9.09; kurtosis = 99.07) and days spent gambling in a four week period (skew = 4.05; kurtosis = 21.35).

The association between socio-demographic variables and gambling behaviour were examined using Chi-square analyses to analyze differences in categorical variables. To reduce the impact of low *N*s, some of the demographic variables were dichotomized. Marital status was coded to distinguish between participants who had a partner and those currently without a partner (widowed, separated or divorced, never married). Education was coded to distinguish between those with some high school education or less and those that had completed high school or obtained post secondary education. The employment dichotomy distinguished between those employed full or part time and those not in the paid labour force (unemployed, homemaker, retired, or receiving social assistance). One-way analyses of variance (ANOVAs) and t-tests were employed to

analyze group differences in gambling behaviour and general physical health, mental health, alcohol use, life satisfaction, and social functioning. When Levene‟s test indicated unequal variances, the degrees of freedom were adjusted for that variable. To control for Type I error, the significance level was set at .025. Because of significant age differences, analyses of covariance (ANCOVAs) were also conducted to control for the effects of age. Z tests were used to determine if demographic differences between groups were significantly different.

Omega squared was used to estimate effect sizes. Although eta squared is commonly used, it is slightly biased as it is based on sums of squares from the sample. Field (2009) recommends using the more complex Omega squared because it makes adjustments to estimate the effect size in the population.

Pearson product-moment correlation coefficients were used to examine the bivariate relationships between the continuous measures. Logistic regression analyses were conducted to assess the contribution of certain social demographic, lifestyle, and gambling variables commonly associated with the risk of problem gambling in adults.

Results

The Infrequency Scale was included to detect confused, careless, or non-purposeful responding. Infrequency scores were examined and five cases with scores of three or more were removed from data analyses. Using the standard procedures outlined in Tabachnick and Fidell (2001), an examination of z scores revealed one outlier on each of the depression and anxiety scales (scores of 14 and 16 respectively). Five outliers were found on the alcohol use measure (representing scores of 13 and higher) reflecting a positive skew. Analyses performed with both the outliers included and excluded, yielded

similar significant group differences for depression and anxiety. However, although no effect of alcohol was found with the outliers included, a significant group difference was noted after the outliers were removed, $F(2, 207) = 3.82$, $p < .05$. Analyses of logarithmic transformations of the alcohol data yielded group differences that were similar to those obtained with the outliers removed, $F(2,211) = 3.31$, $p < .05$. As noted above, the analyses did not differ for depression and anxiety but significant group differences were found for alcohol. A decision was made to conduct analyses of the main variables with outlying scores excluded.

Established procedures recommended by the test authors were used for scoring the missing values for the scales on the SF-36. For all other scales, missing values resulted in the participant being excluded from analyses for that particular scale.

Four significant differences between groups were noted in demographic characteristics (see Table 1). The analyses indicated that the three groups differed in age, $F(2, 215) = 3.93$, $p < .05$, $\omega^2 = .03$, marital status, $\chi^2 (2, N = 236) = 10.10$, $p < .01$, employment, $\chi^2 (2, N = 233) = 8.21$, $p < .05$, and education, $\chi^2 (2, N = 237) = 10.21$, $p < .01$. Non-gamblers ($M = 71.41$, $SD = 9.75$) were significantly older than both recreational gamblers ($M = 66.47$, $SD = 9.56$) and problem gamblers ($M = 64.33$, $SD = 10.42$). In terms of marital status, 45.5% of the recreational gamblers were married. Non-gamblers (84.4%) were more likely to currently be without a partner than recreational gamblers (54.5%), $z = 3.17$, $p < .01$, or problem gamblers (61.5%), $z = -1.98$, $p < .05$). With regard to employment, problem gamblers were more likely than non-gamblers to be employed full time or part time, $z = -2.90$, $p < .01$. Recreational gamblers were more likely than

non-gamblers, $z = 3.14$, $p < .01$, to have completed high school or to have obtained post-secondary education.

There was no significant influence of sex, geographical residence, ethnicity, religion, or household income on gambling levels (i.e., non-gamblers, recreational gamblers, problem gamblers). All three groups were predominantly female. Table 1 summarizes the demographic characteristics of the sample according to level of gambling.

Gambling Behaviour

The majority of the respondents (79.8%) reported having participated in gambling activities. More than half of the sample (59.6%) was classified as recreational or non-problem gamblers (57.3% in Thunder Bay; 63.2% in Brantford). Probable problem gamblers comprised 8.6%. The remaining gamblers ($n = 34$) scored between recreational and problem gamblers and were classified as "at risk". The higher end of the "at risk" bordered on problem gambling while the lower end scored closer to recreational gambling. As the focus of this study was on two distinct gambling categories (recreational and problem), the "at risk" were excluded from group analyses.

The literature suggests that casino gambling is a favourite activity among older adults who tend to prefer slot machines over other games of chance (McNeilly & Burke, 2002; Petry, 2002). The present study supported these prior findings. The most popular gambling activities for the older gamblers as a whole were casinos (67.9%) and playing slots or other gaming machines (63.6%), followed by playing lotteries (61.6%). The least popular gambling activity was betting on sports (2.9%).

Table 1

Demographics by Gambling Level

	Non-Gamblers (n = 32)	Recreational Gamblers (n = 180)	Problem Gamblers (n = 26)
Age*	M = 71.41 (SD = 9.75)	M = 66.47 (SD = 9.56)	M = 64.33 (SD = 10.42)
	Raw Frequencies (%)		
Sex			
Female	28 (87.5)	129 (71.7)	17 (65.4)
Male	4 (12.5)	51 (28.3)	9 (34.6)
Marital Status**			
Married	5 (15.6)	81 (45.5)	10 (38.5)
Not Married[a]	27 (84.4)	97 (54.5)	16 (61.5)
Residence			
Northern Ontario	19 (59.4)	118 (65.6)	19 (73.1)
Southern Ontario	12 (37.5)	55 (30.6)	7 (26.9)
Other	1 (3.1)	7 (3.9)	0
Ethnicity			
Caucasian	21(91.3)	154 (92.8)	19 (79.2)
First Nations	1 (4.3)	4 (2.4)	3 (12.5)
Other	1 (4.3)	8 (4.8)	2 (8.3)

[a] Widowed, divorced or separated, never married
* Differences significant at $p < .05$
** Differences significant at $p < .01$

Table 1 (continued)

Demographics by Gambling Level

	Non-Gamblers (n = 32)	Recreational Gamblers (n = 180)	Problem Gamblers (n = 26)
Religion			
Catholic	9 (29.0)	67 (37.9)	9 (34.6)
Protestant	16 (51.6)	82 (46.3)	9 (34.6)
Other	4 (12.9)	15 (8.5)	7 (26.9)
No religion	2 (6.5)	13 (7.3)	1 (3.8)
Education**			
Some high school education or less	19 (59.4)	55 (30.7)	11 (42.3)
Graduated high school or post secondary	13(40.6)	124 (69.3)	15 (57.7)
Employment Status*			
Employed FT/PT	1 (3.1)	28 (16.0)	8 (30.8)
Not Paid Labour	31(96.9)	147(84.0)	18(69.2)
Family Income			
Below $ 20,000	13 (54.2)	61 (39.1)	9 (34.6)
$20,001-$ 40,000	6 (25.0)	28 (17.9)	9 (34.6)
$40,001-$ 60,000	1 (4.2)	25 (16.0)	4 (15.4)
$60,001-$ 80,000	2 (8.3)	13 (8.3)	0
$80,001-$100,000	0	9 (5.8)	3 (11.5)
Over $100,000	2 (8.3)	20 (12.8)	1 (3.8)

* Differences significant at $p < .05$
** Differences significant at $p < .01$

Problem gamblers (M = 5.17, SD = 1.99) engaged in significantly more types of gambling activities than recreational gamblers (M = 3.82, SD = 1.85), F (1, 177) = 10.77, $p < .01$, $\omega^2 = .05$. Problem gamblers were more likely than recreational gamblers to attend a casino, gamble on slots or other gaming machines, and bet on games of skill. Although problem gamblers were also more likely to play dice games, the expected frequency in one of the cells was below five so should be interpreted with caution.

The most commonly endorsed gambling activities for recreational gamblers were the casino (74.7%) and lotteries (72.5%), while the problem gamblers preferred the casino (100%) and playing the slots or other gaming machines (92.3%). Table 2 compares participation in each activity by gambling group and the statistical significance.

A significant difference was found between recreational gamblers and problem gamblers with regard to the number of days gambled, F (1, 183) = 42.96, $p < .001$, $\omega^2 = .18$, and funds spent on gambling, F (1, 177) = 62.36, $p < .001$, $\omega^2 = .26$, in the four week period preceding the completion of the survey. As both data sets were positively skewed, logarithmic transformations were performed. Analyses revealed similar differences for days gambled, F (1,183) = 35.20, p < .001, and funds spent on gambling, F (1, 177) = 54.05, p < .001. Problem gamblers averaged 7.88 (SD = 9.66) gambling days and spent \$784.32 (SD = 1214.10) as compared to 1.87 (SD = 2.58) gambling days and \$33.02 (SD = 65.13) for recreational gamblers. A detailed review of the data revealed that one problem gambler had spent funds on gambling that far exceeded the others (\$5000). More than one quarter (26.8%) of the problem gamblers had spent between \$800 - \$5000 while one quarter (26.5%) of the recreational gamblers had spent between \$25 - \$500. One third (33.9%) of the recreational gamblers had not gambled at all during the past four

Table 2

Gambling Activities (%) by Group

	Recreational Gamblers (n = 180)	Problem Gamblers (n = 26)	
Cards for Money	42.7	61.5	
Bet Horses, Dogs, Other Animals	25.6	40.0	
Bet Sports	3.0	8.0	
Dice Games*	9.0	24.0	$\chi^2(1, N = 192) = 5.04$
Attend Casino**	74.7	100.0	$\chi^2(1, N = 200) = 8.43$
Bet on Lotteries	72.5	84.6	
Bingo	52.9	72.0	
Stock Market	18.1	12.0	
Slot Machines/Gaming Machines*	69.8	92.3	$\chi^2(1, N = 198) = 5.79$
Bet Games of Skill[t]	16.0	32.0	$\chi^2(1, N = 188) = 3.77$

[t] Trend
* Differences significant at $p < .05$
** Differences significant at $p < .01$

week period. Problem gamblers were also more likely to reside with others that gambled on a regular basis, F (1, 204) = 59.42, $p < .001$, $\omega^2 = .22$.

Although approximately 80% of the gamblers that met the NODS criteria for problem gambling indicated past gambling problems, it was interesting to note that none of the problem gamblers acknowledged any current problems with gambling. Despite these claims, the data indicated that most of the probable problem gamblers (72.8%) reported that they had gambled in the past week. For 42.1 %, it had been one day or less since they last gambled. This is likely an issue related to how diagnostic criteria for problem gamblers are established and will be addressed as part of the Discussion section.

Gambling and Health

Table 3 reports the means for measures of general health, mental health, social functioning, alcohol use, pain, and satisfaction with life. The results are detailed below for each of the groups.

General health. Significant group differences were noted in general health as measured by the health scale of the SF-36, F (2, 230) = 6.08, $p < .01$, $\omega^2 = .04$. Because of significant age differences between the groups, analyses were repeated using ANCOVA to control for age. Results indicated similar main effects, F (2, 214) = 4.96, $p < .01$, $\omega^2 = .04$. Both non-gamblers (Adjusted $M = 60.63$, $SD = 30.51$, $p < .05$) and recreational gamblers (Adjusted $M = 63.41$, $SD = 21.72$, $p < .01$) perceived themselves as significantly more healthy than the problem gamblers *(*Adjusted $M = 47.34$, $SD = 26.99$). There was no significant difference in general health between non-gamblers and recreational gamblers.

Table 3

Means and Standard Deviations of Health Measures by Gambling Level

	Non-Gamblers (n = 32)	Recreational Gamblers (n = 180)	Problem Gamblers (n = 26)
General Health**	61.48 (SD = 29.35)	63.14 (SD = 21.93)	46.01 (SD = 26.66)
HADS Anxiety**	3.48 (SD = 3.15)	4.31 (SD = 3.01)	6.35 (SD = 4.20)
HADS Depression**	2.58 (SD = 2.52)	3.38 (SD = 2.86)	4.96 (SD = 2.78)
Social Functioning**	72.41 (SD = 30.51)	82.50 (SD = 21.25)	68.75 (SD = 26.98)
Alcohol Use*	.85 (SD = 1.26)	1.93 (SD = 2.22)	1.25 (SD = 1.48)
Pain	66.34 (SD = 29.75)	67.08 (SD = 25.05)	57.89 (SD = 26.30)
Life Satisfaction***	27.67 (SD = 4.75)	25.24 (SD = 5.92)	21.35 (SD = 6.68)

* Differences significant at $p < .05$
** Differences significant at $p < .01$
*** Differences significant at $p < .001$

Specific medical conditions. Significant differences between groups were found in cardiac and heart problems, χ^2 (2, N = 231) = 6.02, $p < .05$. When compared to problem gamblers, recreational gamblers were less likely to report heart problems, z = 2.19, $p < .05$. Non-gamblers were more likely than recreational gamblers to report problems with loss of balance, with the difference just short of significance. Table 4 presents the frequency of specific medical concerns by gambling level.

Mental health. Analyses revealed significant differences in HADS anxiety, F (2, 220) = 6.11, $p <= .01$, $\omega^2 = .04$, and depression, F (2, 216) = 4.93, $p < .01$, $\omega^2 = .03$. ANCOVAs were conducted to control for age. Results indicated similar differences in anxiety, F (2, 205) = 5.07, $p < .01$, $\omega^2 = .04$, and depression, F (2, 201) = 5.73, $p < .01$, $\omega^2 = .04$, when age was controlled. As hypothesized, problem gamblers reported experiencing significantly higher levels of anxiety (Adjusted M = 6.29, SD = 4.01) than both recreational gamblers (Adjusted M = 4.39, SD = 3.03, $p < .01$), and non-gamblers (Adjusted M = 3.42, SD = 3.22, $p < .01$). Significantly higher depression was also reported by the problem gamblers (Adjusted M = 5.00, SD = 2.83) than both recreational gamblers (Adjusted M = 3.33, SD = 2.87, $p < .01$) and non-gamblers (Adjusted M = 2.48, SD = 2.56, $p < .01$). For both measures, scores ranging from 0 to 7 are considered normal with scores of 11 or more suggesting the probable presence of a disorder. No significant differences were found between recreational gamblers and non-gamblers. In this sample, small but significant positive correlations were found between gambling scores and depression, r (224) = .16, $p < .05$, and anxiety, r (228) = .19, $p < .01$.

Social functioning. Analyses revealed significant differences in social functioning, F (2, 232) = 5.63, $p < .01$, $\omega^2 = .04$, as measured by the social functioning

Table 4

Specific Health Concerns (%) by Gambling Group

	Non-Gamblers (n = 32)	Recreational Gamblers (n = 180)	Problem Gamblers (n = 26)
Back	65.6	62.2	69.2
Bone or joint	65.6	76.7	84.6
Loss of balance[t]	50.0	31.7	42.3
Muscles	59.4	62.8	76.9
Cardiac or heart[a*]	18.8	17.2	38.5
Hearing or ear	25.0	33.9	30.8
Vision and eyesight	46.9	50.6	65.4
Breathing	43.8	28.3	46.2
Arthritis	62.5	65.0	61.5
Diabetes	18.8	15.6	23.1
Stomach or bowel	25.0	33.3	53.8
Memory	34.4	48.9	61.5
High cholesterol	31.3	38.9	42.3
High blood pressure	40.6	48.3	53.8

[t] Trend; Non-gamblers reported more concerns with loss of balance than recreational gamblers
[a] Problem gamblers more likely than recreational gamblers to report heart problems
[*] Differences significant at $p < .05$

subscale of the SF-36 (Ware and Sherbourne, 1992). ANCOVA to control for age did not affect the findings, F (2, 216) = 5.74, $p < .01$, $\omega^2 = .11$. Recreational gamblers (Adjusted $M = 81.89$, $SD = 21.50$) reported significantly fewer social functioning problems than the problem gamblers (Adjusted $M = 70.31$, $SD = 23.26$, $p < .05$) and the non-gamblers (Adjusted $M = 69.23$, $SD = 30.67$, $p < .01$)

Alcohol use. Significant differences were found between mean scores on the alcohol measure, F (2, 207) = 3.82, $p < .05$, $\omega^2 = .03$. An ANCOVA conducted to control for age revealed that age did not affect the findings, F (2, 194) = 3.61, $p < .05$, $\omega^2 = .02$. Recreational gamblers (Adjusted $M = 2.00$, $SD = 2.25$) scored highest on the AUDIT and the difference was significant when compared to the non-gamblers (Adjusted $M = .64$, $SD = .85$, $p < .05$).

There was no significant difference in scores between the non-gamblers and problem gamblers. Higher scores are associated with a greater likelihood of alcohol-related problems. Guidelines indicate that total scores of eight or more are generally used to indicate potentially hazardous and harmful alcohol use.

In research with university students, a mean score of 3.08 indicated no alcohol-related problems while scores of 6.09 and 9.12 respectively reflected hazardous and harmful alcohol use (Adewuya, 2005). Non-hazardous mean scores in adult medical patients ranged from 4.93 (female) to 6.87 (male) (Bohn, Babor, and Kranzler, 1995).

The analyses of AUDIT questions pertaining specifically to alcohol intake indicate that recreational gamblers consumed more alcohol than the non-gamblers with the difference marginally short of significance. Responses to questions pertaining to alcohol-related consequences suggest that problem gamblers are more likely to suffer

adverse consequences related to their drinking, F (2, 224) = 5.37, $p < .01$, $\omega^2 = .04$, than the other two groups.

Use of prescription medication. All three groups were similar in their use of prescription drugs with the exception of medication for water retention. Problem gamblers (40%) reported using more of this medication than recreational gamblers (18.8%) with the difference approaching significance. The use of various medications by gambling group can be found in Appendix L.

Pain. Pain was measured using the pain subscale of the SF-36 (Ware and Sherbourne, 1992). One-way analyses of variance revealed that pain scores did not differ among groups, F (2, 229) = 1.45, n.s.

Gambling and Life Satisfaction

Significant differences were noted in satisfaction with life, F (2, 225) = 8.22, $p < .001$, $\omega^2 = .06$, as measured by the Satisfaction with Life Scale (Diener et al., 1985). Analyses that were repeated to control for age also indicated similar significant differences, F (2, 208) = 5.17, $p < .01$, $\omega^2 = .04$. Both the recreational gamblers (Adjusted $M = 25.31$, $SD = 6.05$, $p < .05$) and the non-gamblers (Adjusted $M = 27.44$, $SD = 4.87$, $p < .01$) reported significantly higher life satisfaction than the problem gamblers (Adjusted $M = 21.96$, $SD = 6.42$). The analyses revealed no significant differences between the non-gamblers and recreational gamblers.

Gambling and Social Activities

Significant group differences in participation were identified in four social activities: visiting with friends, χ^2 (2, $N = 230$) = 17.45, $p < .001$, exercise and fitness,

χ^2 (2, N = 229) = 7.49, p < .05, attendance at social functions, χ^2 (2, N = 229) = 12.14, p < .01, and playing cards and games, χ^2 (2, N = 230) = 7.87, p < .05. Problem gamblers visited with friends significantly less than both other groups. Recreational gamblers participated in exercise and fitness activities more than problem gamblers and their attendance at social functions was significantly higher than the other groups. Both problem and recreational gamblers played significantly more cards and games than the non-gamblers. Statistical information regarding the differences in social activities by gambling group can be found in Table 5.

Relationship of Age to Specific Gambling Activities

As mentioned previously, age effects were found in gambling behaviour with problem gamblers and recreational gamblers significantly younger than non-gamblers. Independent sample *t*-tests were conducted to compare the age of older adults that participated in specific gambling activities to those who did not gamble on that activity. Ages were significantly lower for individuals betting on lotteries (M = 65.06, SD = 9.14), t (236) = 2.86, p < .01, and playing games of skill for money (M = 63.19, SD = 7.92), t (226) = 2.15, p < .05. A series of *t*-tests revealed that ages were also significantly lower for individuals who engaged in five specific problem gambling behaviours: hiding signs of gambling from family or other important people (M = 58.75, SD = 8.36), t (241) = 3.37, p < .01, arguing about money (M = 58.5, SD = 5.67), t (64.04) = 7.62, p < .001, money arguments about gambling (M = 56.8, SD = 6.37), t (241) = 3.34, p < .01), borrowing gambling money from spouse (M = 59.7, SD = 8.62), t (204) = 2.42, p < .05,

Table 5

Social Activities (%) by Gambling Group

	Non-Gamblers Gamblers (n = 32)	Recreational Gamblers (n = 180)	Problem Gamblers (n = 26)
Visit with Friends[a***]	90.3	82.7	50.0
Exercise and Fitness[b*]	41.9	51.2	23.1
Attend Social Functions[c**]	41.9	64.5	34.6
Play Cards[d*]	25.8	51.4	57.7

[a] Problem gamblers visit less than recreational gamblers (z = 3.52, p <.001) and non-gamblers (z = 3.08, p < .01)

[b] Problem gamblers exercise less than recreational gamblers (z = 2.46, p < .05)

[c] Recreational gamblers attend more social functions than problem gamblers (z = 2.69, p < .01) and non-gamblers (z = 2.17, p <.05)

[d] Problem gamblers (z = 2.17, p < .05) and recreational gamblers (z = 2.44, p < .05) play more cards and games than non-gamblers.

[*] Difference significant at p < .05
[**] Difference significant at p < .01
[***] Difference significant at p < .001

and borrowing gambling money from friends and relatives (M = 57.0, SD = 6.97), t (204) = 3.04, $p < .01$. Further statistical information regarding these problem behaviours can be found in Appendix M.

A t-test was also conducted to assess whether age was related to lost time from work due to gambling. The results revealed that the employed individuals who had missed work due to gambling (M = 52.4, SD = 2.79) were younger than those who had not missed work *(*M = 57.9, SD = 6.27, t (41) = 1.94), with the difference approaching significance.

Regional Variations in Gambling - Urban versus Remote Populations

Contrary to predictions, there was no significant difference between respondents in Northern Ontario and Southern Ontario in gambling frequency, F (1,229) = .13, n.s. or in money spent on gambling, F (1,222) = 1.54, n.s. (Northern Ontario M = $122.90, SD = 477.44; Southern Ontario M = $48.35, SD = 115.26). Further inspection of the data revealed that four of the study participants, all from Northern Ontario, spent funds on gambling that were very different from the others: $1500 (1), $2000 (2), and $5000 (1). Independent sample t-tests comparing total scores on both gambling measures revealed no significant differences in scores for the SOGS, t (175) = 1.04, n.s. (Northern Ontario M = 1.34, SD = 2.82; Southern Ontario M = .87, SD = 1.96) and the NODS, t (232) = .87, n.s. (Northern Ontario M = .88, SD = 2.02; Southern Ontario M = .64, SD = 1.56). Chi-square analyses of specific SOGS problem gambling behaviours (i.e., gambling more than intended, feeling guilty about gambling, hiding signs of gambling, unpaid debt due to gambling) yielded no significant regional differences.

A comparison of various gambling activities indicated that compared to gamblers from Northern Ontario, Southern Ontario gamblers tended to bet on horses or other animals, χ^2 (1, N = 238) = 21.87, p < .001, and play the stock market, χ^2 (1, N = 239) = 12.43, p < .001. Table 6 reports the frequency of gambling activities by region.

Analyses of the financing of gambling activities indicated one significant regional difference. Gamblers from Northern Ontario were significantly more likely to borrow from household funds to finance gambling activities, χ^2 (1, N = 209) = 4.53, p < .05. Table 7 reports the financing activities by region.

Risk Factors for Problem Gambling

Logistic regression analyses were employed to test for unique predictors of problem gambling in older adults. The model included variables commonly associated with problem gambling behaviours. Odds ratios were estimated for these variables. Predictor variables were divided into three categories: social demographic, lifestyle, and gambling-related variables. Two of the social demographic variables, marital status and education were coded as dichotomous variables.

Logistic regression revealed some interesting relationships between predictor variables and the risk for problem gambling. For the social demographic variables, having a parent that gambled, residing in a household where others gambled regularly, and having no current marital partner (i.e., never married, widowed, separated, or divorced) were significant predictors. In the lifestyle category, social functioning scores, visits with friends, and attending social functions were predictors. For the gambling variables, funds spent in a four week period was a significant predictor.

Table 6

Gambling Activities (%) by Region

	Northern Ontario (Rural)	Southern Ontario (Urban)
Cards for Money	43.2	50.0
Bet Horses, Dogs, Other Animals***	15.1	43.1
Bet Sports	3.5	2.8
Dice Games	8.2	9.9
Attend Casino	78.3	83.3
Bet on Lotteries	70.3	78.4
Bingo	56.1	52.1
Stock Market***	10.1	28.2
Slot Machines/Gaming Machines	74.7	75.3
Bet Games of Skill	17.3	15.9
Largest Amount Gambled on One Day		
$1 - $10	30.1	18.1
>$10 - $100	51.1	58.3
>$100 - $1000	11.8	11.1
>$1000 - $10,000	1.6	4.2
> $10,000	0	1.4

***Differences significant at $p < .001$

Table 7

Financing of Gambling Activities by Region

	Northern Ontario (Rural)	Southern Ontario (Urban)
Borrow from Household Funds*	11.1	1.8
Borrow from Spouse	4.5	5.4
Borrow from Relatives/Friends	5.2	0
Borrow from Financial Institutions	3.9	5.3
Borrow on Credit Cards	5.8	7.0
Loan Sharks	1.3	0
Cashed Stocks or Securities	2.6	0
Sold Personal or Family Property	2.6	0
Chequing Account (bad cheques)	3.2	1.8
Credit Line – Bookie	.7	0
Credit Line – Casino	0	0

*Differences significant at $p < .05$

When all the predictors of problem gambling were entered, six unique predictors emerged to account for more than three quarters of the variance, Nagelkerke $R^2 = .76$. Residing in a household where others gambled regularly predicted problem gambling, $\chi^2 (1, N = 154) = 8.26$, $p < .01$, increasing the risk by more than 11 times, odds ratio (OR) = 11.47. Not currently having a marital partner, $\chi^2 (1, N = 154) = 5.05$, $p < .05$, increased the risk by over 21 times ($OR = 21.51$). Visiting with friends and attending social functions diminished the risk of problem gambling by 93.8% and 91.9% respectively. Results can be found on Table 8.

Supplementary Analyses

Although predictions were not made with respect to sex differences, in order to further explain gambling and health, supplementary analyses were conducted.

Sex Differences in Gambling

Most of the research on older gamblers has not examined differences between men and women. Analyses of recreational and problem gamblers revealed significant sex differences on SOGS scores, $F (1, 189) = 5.64$, $p < .05$, $\omega^2 = .02$, with males ($M = 1.81$, $SD = 3.59$) more likely to score higher than females ($M = .86$, $SD = 1.94$). Differences on NODS scores were not significant.

The gambling activity that was most popular for each sex differed. The males preferred playing the lotteries while for females, it was attending a casino. Sex was a factor in the choice of other gambling activities and many gambling behaviours. Women were significantly more likely to play bingo, whereas males were more likely to play cards, bet on animals, bet on sports, and play dice games, lotteries, the stock market, and games of skill. Table 9 reports the participation in gambling activities by sex.

Table 8

Social Demographic, Lifestyle, and Gambling Variables Associated with the Risk of Problem Gambling

Variable	Predictor	Category LR		Combined LR[d]		95% CI
		P	OR	P	OR	
Social Demographic[a]	Parents that gambled[e]	.001	18.65	-	-	-
	Residing with gamblers	.000	10.398	.004	11.465	2.17 – 60.48
	No current marital partner	.02	5.457	.025	21.507	1.48 – 312.45
Lifestyle[b]	Social functioning	.002	.971	.005	.946	.91 - .98
	Visits with friends	.001	.210	.008	.062	.01 - .49
	Attending social activities	.011	.293	.034	.081	.01 - .82
Gambling[c]	Funds spent in 4 week period	.011	1.008	.003	1.014	1.01 - 1.02
	Days gambled in a 4 week period[e]	.119	1.107	-	-	-

[a] $N = 168$
[b] $N = 191$
[c] $N = 159$
[d] $N = 154$
[e] Not a significant predictor in the combined model

Table 9

Sex Differences in Gambling Activities (%)

	Male	Female	
Cards for Money*	57.1	40.2	χ^2 (1, N = 256) = 6.22
Bet Horses, Dogs, Other Animals**	36.8	18.2	χ^2 (1, N = 246) = 9.97
Bet Sports***	10.4	0	χ^2 (1, N = 249) = 18.46
Dice Games*	16.9	6.4	χ^2 (1, N = 249) = 6.72
Attend Casino	84.4	76.5	n.s.
Bet on Lotteries**	86.1	67.4	χ^2 (1, N = 254) = 9.65
Bingo***	36.0	62.5	χ^2 (1, N = 259) = 15.11
Stock Market**	26.3	11.2	χ^2 (1, N = 246) = 9.02
Slot Machines/Gaming Machines	79.2	72.4	n.s.
Bet Games of Skill***	39.7	8.8	χ^2 (1, N = 244) = 33.16
Largest Amount Gambled on One Day			
$1 - $10	20.8	29.6	
>$10 - $100	58.4	50.3	
>$100 - $1000	14.3	11.1	
>$1000 - $10,000	3.9	1.6	
> $10,000	0	.5	

* Differences significant at $p < .05$
** Differences significant at $p < .01$
*** Differences significant at $p < .001$

Men were significantly more likely to claim wins, hide evidence of gambling, and engage in arguments about money. Men were also more likely to argue about money spent on gambling, however, this analysis may be questionable as the expected frequency in one of the cells was below five. A summary of the problem gambling behaviours by sex can be found in Table 10.

Although funds spent on gambling did not differ significantly, men (M = 4.64, SD =7.00) tended to have gambled on more days than women (M = 1.95, SD = 3.13) in the month prior to the survey, F (1, 237) = 16.88, $p < 001$, $\omega^2 = .06$. Women were significantly more likely to have spent time visiting with friends and participating in religious services. There were no significant differences between men (10.3%) and women (13.7%) in gambling to escape problems or relieve uncomfortable feelings, depression, or anxiety, χ^2 (1, N = 260) = .60, n.s.

Discussion

The main objective of this study was to examine the relationship between gambling and health in a sample of older adults in Ontario, and to explore the potential association of health gains with recreational gambling. The second objective was to investigate the association of gambling with life satisfaction. An additional purpose was to explore the relationship of gambling behaviour with socio-demographic factors. The fourth and final objective of this study was to examine whether regional variations in gambling exist when comparing participants from an urban location to a more remote location.

Table 10

SOGS Problem Gambling Behaviour (%) by Sex

	Male	Female	
Chase Gambling Losses[a]	3.9	0.5	
Claim Gambling Wins (lying)**	25.0	11.9	$\chi^2(1, N = 253) = 6.89$
Gambling Problems – in the past	13.0	8.5	
Gambling More Than Intended	24.7	24.6	
Gambling Criticism by Others	14.7	7.5	
Gambling Guilt	17.3	16.5	
Inability to Stop Gambling	6.6	7.8	
Hiding Signs of Gambling*	11.5	3.7	$\chi^2(1, N = 265) = 5.89$
Arguments about Money***	24.7	8.1	$\chi^2(1, N = 263) = 13.35$
Money Arguments about Gambling**	9.1	1.6	$\chi^2(1, N = 263) = 8.33$
Unpaid Debt Due to Gambling	5.2	1.1	
Lost Time from Work	2.6	1.6	
Borrow from Household Funds	12.5	6.3	
Borrow from Spouse	6.3	3.7	
Borrow from Relatives/Friends	4.7	3.1	
Borrow from Financial Institutions	6.3	3.1	
Borrow on Credit Cards	4.7	6.1	
Loan Sharks	3.2	0	
Cashed Stocks or Securities	3.1	1.2	
Sold Personal or Family Property	4.7	0.6	
Chequing Account (bad cheques)	3.1	2.5	
Credit Line – Bookie	1.5	0	
Credit Line – Casino	0	0	

[a] Chase losses some of the time
* Differences significant at $p < .05$
** Differences significant at $p < .01$
*** Differences significant at $p < .001$

Relationship with Health

Consistent with prior research (Bazargan et al., 2000; Black et al., 2003; Erickson et al., 2005; Gerstein et al., 1999; Pietrzak et al., 2005; Pietrzak et al., 2007), this study provided further evidence for the association between problem gambling and health in older adults. Problem gamblers reported significantly poorer general health than older adults without gambling problems and endorsed a number of medical conditions. Problem gamblers were also more likely than recreational gamblers to report cardiac and heart problems. Pietrzak et al. (2007) found problem gamblers more likely to have a past year diagnosis of angina. Older adults that are frail or have medical concerns may gamble because it is an activity that requires little physical effort. Alternatively, the stressors associated with problem gambling behaviour may impair general health. Whether poor health precedes gambling or occurs as a result of gambling can only be speculated.

Problem gamblers were distinguished by significantly greater reported levels of depression, anxiety, and lower social functioning. These results extend previous research associating problem gambling with depression (Black et al., 2003; Blaszczynski & McConaghy, 1988; Cunningham-Williams, et al., 1998; Linden et al., 1986; Petry et al., 2005; Pietrzak et al., 2007; Shaffer & Korn, 2002), anxiety (Black & Moyer, 1998; Shaffer & Korn, 2002; Petry et al., 2005; Pietrzak et al., 2007), and poorer social functioning (Pietrzak et al., 2005).

Prior research had suggested that older recreational gamblers would report better health than older non-gamblers (Desai et al., 2004; Korn & Shaffer, 1999; Loroz, 2004; Vander Bilt et al., 2004). Unexpectedly, recreational gambling was not associated with better health in this elderly sample. As there were no significant differences between

recreational gamblers and non-gamblers on measures of general health, the prediction of better health in recreational gamblers could not be supported. There were also no meaningful differences between recreational gamblers and non-gamblers on measures of depression and anxiety, therefore the hypothesis that recreational gamblers would report the lowest depression and anxiety was not supported. There is the possibility of floor effects. Because data collection was cross-sectional, and the non-gambling sample was small in comparison, longitudinal research with a larger sample of elderly non-gamblers may provide different results.

Interestingly, when Currie et al. (2008) recently surveyed gambling experts (researchers, clinicians, and policy-makers) in Canada and the United States, over half of the respondents believed that low-risk gambling (recreational) may have psychological benefits. The researchers‟ suggestion to establish empirically-based gambling limits and a dose-response relationship depicting health benefits at low-risk levels and problems at higher levels warrants further investigation.

Contrary to the findings of previous studies with the general population (Gerstein et al., 1999, Morasco, Pietrzak, et al., 2006; Shaffer & Korn, 2002) and with older adults (Pietrzak et al., 2007), there was no evidence to support an association between problem gambling and elevated rates of alcohol use. One explanation could be that the problem gamblers under-reported their alcohol consumption. As the problem gamblers reported poorer health, it is also possible that older adults with health deficiencies may drink less than others with good health. Overall, the reported alcohol consumption was low. Age-related decline in alcohol consumption has been noted in the literature (Moos, Schutte, Brennan, & Moos, 2004).

Life Satisfaction

Problem gamblers were significantly less satisfied with life than the other two groups. This could be due to the adverse physical, emotional, and financial consequences associated with problem gambling. Both recreational gamblers and non-gamblers reported similar satisfaction with life.

Life satisfaction can be affected by a number of factors. As aging in older adults tends to be associated with poorer health, functional problems, less finances, and fewer social contacts, it is generally assumed that life satisfaction declines in old age (Chen, 2001; Gwozdz & Sousa-Poza, 2010). Despite the difficulties associated with aging, research findings vary on the relationship between age and life satisfaction. Existing theories suggest that life satisfaction can decrease, increase, or remain relatively constant over the lifespan. The inconsistent findings in studies seem counterintuitive at times because of the reported well-being in elderly people in spite of age-related losses and declines.

Recent research supports the stability of life satisfaction. Using data from two large studies in Britain and Germany, Baird, Lucas, and Donnellan (2010) demonstrated that life satisfaction did not decrease over much of adulthood except for a steep decline among those older than age 70. Similar results were found by Gwozdz and Sousa-Poza (2010) with life satisfaction remaining relatively constant until age 85 followed by a rapid decline thereafter. The decline in life satisfaction in the very old could be related to deteriorating health or loss of social support while approaching the end of life. Stones, Worobetz, and Brink (2011) reviewed recent studies on life satisfaction and concluded

that heritability explains from 38-59% of the variability in life satisfaction and that heritable personality traits contribute to the stability of life satisfaction.

Using data from the Swedish twin study, Berg, Hassing, Thorvaldsson, and Johansson (2011) found that personality traits influenced the association between health and life satisfaction in late life supporting both the top-down and bottom-up approaches on assessments of life satisfaction. As stated, top down assumes a tendency to view life experiences as positive or negative driven by personality traits that remain relatively stable. Bottom-up assumes that contextual factors are more influential and that life satisfaction will fluctuate (Berg et al., 2011). After reviewing numerous studies of life satisfaction, Pavot & Diener (2008) suggested that the evaluation of life satisfaction is influenced by a complex combination of both situational factors and personality with broad personality traits „setting the tone" for subjective experiences.

Research from around the world has linked personality to life satisfaction. Contextual factors have been found to exert a small influence (Siedlecki, Tucker-Drob, Oishi, & Salthouse, 2008). The significantly lower satisfaction reported by problem gamblers may have had more to do with personality traits than with factors related to gambling. An alternative interpretation for lower life satisfaction in problem gamblers could be that unhappy individuals or those less satisfied with their lot in life are more prone to engage in problem behaviours such as gambling. An examination of older adults in other problem areas may reveal similar results due to the influence of temperament or personality.

Siedlecki et al. (2008) found that negative affect was a significant predictor of life satisfaction across the age groups. Problem gamblers in this sample reported more

negative affect (depression and anxiety) which may be influenced by personality and dispositional attributes (i.e., optimistic and seeing the glass half full vs. pessimistic and seeing the glass half empty). This theory may also have implications for evaluations of general health. However, the current study did not measure personality factors. Future research should incorporate personality when investigating the relationship of gambling to health and life satisfaction in the elderly.

Gambling Behaviour and Socio-demographic Factors

Gambling in older adults has increased dramatically in recent years (Gerstein et al., 1999), in part because gambling has become socially acceptable. In the lifetime of these older adults, gambling would have gone from an immoral and illegal activity to one that has been encouraged, operated, and regulated by the government. Almost 80% of the participants in this study reported gambling. These results are consistent with past prevalence studies that reported between 76% - 86% of the general adult population had gambled (Cox et al., 2005; Stevens & Beristain, 2004; Wiebe et al., 2001) and a lifetime gambling rate of 80% in older adults (Gerstein et al., 1999). Noting that this was not a random sample, the results would appear to suggest that gambling is a popular activity for older adults. It is also possible that gambling participation may be over-estimated as non-gamblers may have been less likely to participate in a gambling study.

Population projections indicate that the older adult population will experience unprecedented growth. With approximately 11,000 OLG retailers, gambling is available almost everywhere in this province, even at the grocery store where numerous kinds of scratch and lottery tickets can be purchased. With the aging population and the availability and accessibility of gambling and gambling venues, we can expect even

further increases in gambling participation in the elderly. A large number of „baby boomers" will be entering this age cohort. Because of pension improvements, early retirement, and the retirement of two income-earner families, many of the seniors will have more disposable income and more time for leisure and recreational activities. As this cohort will also have been socialized into a more liberal gambling environment, it is important to monitor their gambling patterns in the future.

Although the majority of participants in this study "reported" no problems resulting from gambling, 8.6% met the criteria for problem gambling. The high rate may be due in part to the lower age threshold in this study. Problem gamblers have also been found to have higher participation rates when surveys to assess gambling are described as "gambling" versus "health and recreation (Williams & Volberg, 2009). Research has linked the increase in problem gambling to gambling availability and social acceptance (Gerstein et al., 1999; McNeilly & Burke, 2001; Shaffer et al., 1999). Gambling availability may have had an influence on the rate of problem gambling in this sample as participants were recruited from two communities with gambling venues. Rates may be lower in areas that do not have casinos.

Another possible reason for the high rate of problem gamblers may be the criteria for classification in the DSM-IV. Unlike many disorders in the DSM-IV, pathological (problem) gambling does not specify the clustering of symptoms within a set time frame. An individual could meet the diagnosis if the minimum five criteria are met in the last month or if each of the symptoms had been experienced at different points during their lifetime, suggesting that pathological gambling is a chronic rather than an episodic disorder. Therefore, a pathological gambler who becomes a social gambler, or ceases to

gamble altogether carries this diagnosis for his or her lifetime. Investigators have found that for many gamblers, changes in gambling behaviour and symptoms do occur and natural recovery is common without formal treatment (Abbot, Williams, & Volberg, 2004). Data drawn from two large epidemiological studies in the United States have indicated that 36% - 39% of individuals with a lifetime history of pathological gambling did not experience any DSM-IV symptoms in the past 12 months. Among the participants in the National Epidemiological Survey and Alcohol and Related Conditions (NESARC), those that did not endorse any past-year pathological gambling symptoms had been symptom free for an average of 7.7 years. Over half had been free of symptoms for five or more years (Slutske, 2006). Comparisons of past year to lifetime gambling in community samples suggest that one-third to almost one-half of lifetime problem and pathological gamblers no longer meet the diagnostic criteria (Hodgins, Wynne, & Makarchuk, 1999). Symptoms present in the past 12 months would provide a more accurate representation of current pathological gambling status. Further research is needed to explore the stability of pathological gambling over short time periods and to reach a consensus on a symptom-free period that would constitute remission and recovery. In addition, research on the validity of DSM-IV criteria in older adults is limited (Hong, Sacco, & Cunningham-Williams, 2009). It is conceivable that some older gamblers may fall short of the five DSM-IV criteria yet have significant gambling problems.

As this was not a random sample, this high rate should be viewed with caution. Alternatively, it is possible that the problem gambling rates could even be higher than reflected in the data. Some individuals could have been reluctant to self-disclose personal

problems or to share information that might be considered socially unacceptable, so may have under-reported the extent of their gambling activities because of shame or guilt. Concealing the extent of gambling involvement is one of the DSM diagnostic criteria.

If the current problem gambling rate was applied to the census estimates, approximately 3,512 older adults in the Thunder Bay District could be classified as probable problem gamblers. This is disturbing. Research by Shapiro et al. (1984) suggests that few from this age cohort would seek treatment, perhaps to avoid humiliation or embarrassment or due to fears of being judged. Were treatment to be sought, this would have a substantial impact on the health care system and social service resources.

The gamblers in this sample tended to favour casinos and slot machine gambling. These findings are consistent with other literature on older adults (McNeilly & Burke, 2002; Petry, 2002). The casino environment may foster opportunities for socialization while participating in activities that are exciting and fun. As well, there exists the possibility (however small) of winning money. Occasional wins on the slot machines are usually not enough to offset losses, but this type of reinforcement may be enough to keep the elderly gambling. In addition, the seniors that gamble have the opportunity to exert some control in their lives by making choices about types of gambling activities and funds spent on gambling. Effective marketing of casino promotions and incentives to seniors may be a factor. Casino gambling could also be preferred because less physically active older adults or those with medical conditions may be attracted to more sedentary gambling activities (Morasco, Pietrzak, et al., 2006).

As gambling participation in older adults increases, the rates of gambling problems in senior gamblers are expected to rise further (Petry, 2002) along with

gambling-related harm. Analyzing data obtained from a nationally representative population sample (2002 Canadian Community Health Survey), Currie et al. (2006) found that the risk of experiencing harm (i.e., negative consequences) from gambling activities increases steadily the more often a person gambles and the more funds that are invested in gambling. Harm from gambling was assessed using 15 gambling-related problems from the Canadian Problem Gambling Index (CPGI). In the current study, higher gambling expenditures, more frequent gambling, as well as participation in more types of gambling activity were associated with problem gambling.

Currie et al. (2006) suggest that the risk of harm is also affected by type of gambling activity. These researchers determined that while lottery play was a low risk at all levels of frequency, the risk of gambling-related harm from electronic gaming machines and casinos increases with frequency of play. Combining data from a variety of gambling prevalence surveys conducted in Canada, Currie, Miller, Hodgins, and Wang (2009) found that individuals who gambled on electronic gaming machines or casino games were at elevated risk (on average three to five times more likely) to experience harm compared to individuals who engaged in other forms of gambling activity. Harm was defined as negative consequences affecting the individual and his or her family. The nine survey items used to assess harm (i.e., relationship problems, financial problems, health problems) were drawn from the Problem Gambling Severity Index of the CPGI.

The majority of recreational gamblers (69.8%) and problem gamblers (92.3%) in the current study played the slots or gaming machines. Research suggests that gaming machines are a popular gambling choice among older adults. Investigators have found that the risk of experiencing gambling-related harm from gaming machines is higher than

with other gambling activities, and increases with frequency of play. This causes reasons for concern as the financial consequences alone could be devastating for older adults. As many of the elderly have retired, they may be more vulnerable to financial hardship from gambling losses. Recovery would be difficult as they are living on a fixed income with limited possibilities for future earnings. Even with losses, they may continue to gamble because of secondary benefits (i.e., combat loneliness) and gambling pathology may proceed more quickly. Given the popularity of casinos and slot machine gambling in this age cohort, there is a need for greater public awareness of the increased risk of harm associated with this gambling activity.

Social Production Functions, a broad gerontological theory, provides an explanation as to why some older adults may be more susceptible to problem gambling in later life. When social needs are not being met, gambling, like other addictions, may serve as a substitute (Lichtenberg & Martin, 2009). In testing for potential predictors of problem gambling risk, logistic regression analyses indicated that the strongest odds ratio was associated with having no current marital partner. The importance of social networks was demonstrated as older gamblers in this study who enjoyed a variety of other non-gambling social activities (i.e., visits with friends, exercise and fitness, and social functions) were less likely to demonstrate gambling problems.

The literature suggests that a genetic trait involving altered dopamine function can lead to behaviours that seek the release of dopamine, thereby predisposing individuals towards addictive, impulsive, and compulsive behaviours. These behaviours include substance addiction and gambling (Bergh, Eklund, Sodersten, & Nordin, 1997; Blum et al., 2008). This genetic trait is an important determinant of a condition known as reward

deficiency syndrome (RDS; Blum et al., 2008). In an earlier study of Caucasian pathological gamblers from various sites across the US, Comings et al. (1996) found that the presence of the reward gene (dopamine receptor D2) was significantly higher in pathological gamblers when compared to controls. As the relationship between RDS and problem gambling is a developing area, it is too early to speculate about age differences in this gene or whether it varies by gender. Further research with elderly gamblers is necessary.

Marketing techniques aimed at the older population may also make them more vulnerable to gambling problems. In Ontario, OLG offers exclusive weekly casino promotions to older adults with age in cash draws, as well as restaurant discounts and slot play offers based on funds spent. These incentives and promotions can get older individuals "hooked" on gambling. Limiting marketing promotions and removing ATMs from casinos may discourage excessive gambling.

In this sample of older adults, age was found to have a significant association with gambling behaviour. Problem and recreational gamblers tended to be younger than non-gamblers. Age was found to be significantly lower for certain problem gambling behaviours. The younger cohort of older adults were more likely to endorse hiding gambling from others, arguing about money, arguing about gambling money, and losing time from work due to gambling. A possible explanation for the age difference in hiding gambling and arguments over money is that as the older adults approach the end of life, they may have more favourable attitudes to gambling and may have adopted a "you can't take it with you" view. Saving money may have become less important because at this point in their lives, what is there left to save for? In addition, more than 1/2 (55.4%) of

the gamblers in this sample had no current partner to hold them accountable for their gambling activities. Those borrowing money from spouses and friends, or relatives were also significantly younger. The older cohort may have lesser expenses and require fewer necessities. With the decreased expenses, there may be less need to borrow as more disposable income would be available for gambling.

The sample was not representative of the population with respect to sex. The 2006 Canada census indicates that approximately 53% of the individuals aged 55 or better were female whereas 72.5% of the participants in this study of adults aged 50 or more were female. In many of the gambling studies cited, female participation matched or exceeded male participation. In research on adult development, Todd, Davis, and Cafferty (1983-1984) found that women volunteered more readily than men except among the sixty to eight year olds. The high number of female participants in this study may represent volunteer bias where people who volunteer for research have different characteristics than those who do not volunteer or it could simply be a reflection of greater female interest in the topic of gambling and health.

All three groups in this study were predominantly female. Prior studies (Blanco et al., 2006; Bland et al., 2003) found problem gambling rates that were two to three times higher in men. Despite the limitations of a convenience sample, gambling and problem gambling behaviours appear to be on the rise for older women. Other studies have reported that the proportion of women problem gamblers has increased. In research with treatment seeking pathological gamblers, women comprised the majority (Petry, 2002). Among a sample of gamblers entering treatment, Tavares et al. (2001) found that women began gambling later than men, yet the progression of gambling disorders was more than

two times faster in women than in men. This "telescoping effect" was described by Tavares et al. (2003) as a potential gender vulnerability factor for gambling. Slutske, Zhu, Meier, and Martin (2010) investigated the role of genetics and concluded that genetic influences were important in the etiology of problem and pathological gambling in women and men. Another possibility exists. The two most preferred gambling activities by women (casinos and slot machines) could be more addictive in nature and this could have an effect on gambling progression. Slot machine playing is reinforced by occasional wins and near-wins, even though the amounts won may not be large. Reinforcement may also occur vicariously by hearing announcements of wins and by seeing other gambling patrons winning. Most of the research reflects the view that gaming machines contribute more to problem gambling than other gambling activities.

Sex differences emerged in gambling activities. Men preferred the lotteries whereas for women, it was attending a casino. Although the difference in funds spent gambling was not significantly different, men gambled on more days and were likely to engage in more problem gambling behaviours. Betting on lotteries was the most popular activity among men and generally involves wagering small amounts on a weekly or more basis. As the actual amount of time spent in gambling activities was not assessed, men may also have engaged in their next most popular activities (i.e., casino, slot machines) more frequently, but for shorter periods of time. Casino gambling preferred by women typically involves higher wagers than lottery tickets.

Regional Variations

The differences in scores on gambling measures, gambling frequency, and problem gambling behaviour between Northern Ontario and Southern Ontario

participants were not significant. Gambling participation may be high in both areas due to the availability of gambling venues as well as the inducements offered by the casinos. In Southern Ontario, the availability of several gambling venues (i.e., casinos, racetracks) in close proximity did not appear to influence gambling rates in this sample. Prior studies have linked the availability of gambling to increases in gambling and problem gambling behaviour. It may be the case for older adults that it is not so much the number of gambling venues as having any gambling venue (versus none). Gambling may also have become the social activity of choice for seniors in both locations. Research by McNeilly and Burke (2001) found that gambling was the most frequently identified social activity for older adults.

Limitations and Strengths

Because the study consisted of a convenience sample with a higher proportion of females than exists in the population, the results may not generalize to the population. As mentioned previously, although recruitment attempts were made at the casinos, and this might suggest a sampling bias, only a small proportion of participants (3.9%) were obtained through ads at the casinos. Because this was a cross-sectional study, no determinations can be made about causal relationships or the direction of associations between health and gambling variables (i.e., whether psychological problems predated gambling problems).

The results were drawn from self-report which is subject to self-report bias. Older adults may have been reluctant to admit the extent of their gambling behaviours and gambling-related problems due to age-related perceptions of how they should behave (Wiebe & Cox, 2005). A further limitation is the use of gambling screens that are not

designed for older adults. Although additional questions about gambling behaviour may have improved the findings, any further increases to the length of the survey could have resulted in respondent fatigue or less participation. The potential for poor recall with the more senior members of this age cohort also exists. A larger number of problem gamblers and non-gamblers would have improved the results.

The differences in age were not anticipated, however no differences in main effects were found when analyses were conducted to control for age.

The strengths of the current study include recruitment from two communities in different geographical areas in Ontario and the use of two gambling measures: the more traditional SOGS and the more recent NODS. Both measures are highly correlated.

Future Research

Longitudinal research is needed to examine for causal relationships between gambling and health in older adults. Comparisons of health, social functioning, and life satisfaction of older adults in communities with easy access to gambling venues to the elderly in communities where gambling venues are not readily accessible would also be of interest. Other variables not assessed in the present study such as personality traits and cognitive functioning (i.e., impairment) could also be included.

Few studies have examined the motives behind gambling in the elderly. Older adults face a series of unique circumstances and life transitions: retirement (decrease in income and increase in leisure time); death of a spouse, family, or friends (shrinking social networks and social support); decline in health and age-related physiological change (decrease in physical capabilities and mobility), and a lack of alternate leisure activities and fewer opportunities to socialize (McNeilly & Burke, 2000). With fewer

social contacts, they may rely on the casino environment to meet their social and recreational needs or gamble to provide a form of distraction from the changes, challenges, and losses associated with aging. The relationship between gambling, age-related circumstances and losses, depression, and anxiety needs to be better understood in older adults.

In a study of casino gambling among older adults (age 55 and older) in North Dakota, marketing strategies and incentives were found to be effective gambling motivators (Bjelde et al., 2008). In Ontario, OLG weekly promotions are aimed at adults aged fifty and older and include „age in cash" membership draws, subsidized meals, cash vouchers, and gifts based on a tracking system that records level of play. All of these incentives are designed to encourage older adults to spend more money and gamble for extended periods of time. Future research could explore the impact of incentives and marketing strategies on gambling behaviour in older adults.

OLG has announced plans to increase gambling accessibility with the introduction of internet gambling in 2012. The impact of internet gambling on gambling prevalence in older adults should be investigated.

Recent research suggests that gambling disorders progress more than twice as fast in women due to a potential genetic vulnerability or the nature of some gambling activities (Tavares et al., 2003). The proportion of men that participated in this study was lower than women. Further research with a representative sample of men and women is necessary to explore the progression of gambling pathology, the "telescoping" theory, and whether certain forms of gambling are more addictive in older adults. As research suggests that aboriginals are more likely to be at risk of gambling problems (Marshall &

Wynne, 2003) and risk taking has traditionally been part of their culture, research with the aboriginal population would also be beneficial.

Gambling measures have not been designed for use with older individuals. Older adults may experience negative consequences at subthreshhold levels of problem gambling. Research into the development of a new gambling screen or a modification of current instruments with age-appropriate items that measure the unique contextual and social variables of the elderly is warranted. Questions pertaining to gambling wins and losses, funds spent on specific gambling activities, and actual time spent gambling would be relevant.

Conclusion

This study examined the relationship between gambling and health in a sample of adults aged fifty and older (n = 302). Further support was found for the relationship between problem gambling and poorer health and social functioning. As both non-gamblers and recreational gamblers perceived themselves as healthier than problem gamblers, there was no evidence of a relationship between recreational gambling and health in this sample.

Although the results suggest that gambling is not a problem for most older adults, 8.6% met the criteria for probable problem gambling. One possible reason for the high problem gambling rate may be the unclustered symptoms specified in the DSM-IV.

Older adults may be more vulnerable to gambling and gambling problems because of age-related circumstances, proximity to gambling venues, and casino marketing programs and incentives. Those who participated in other non-gambling social

activities were less likely to demonstrate gambling problems. Further examination of gambling behaviour in older adults and the influence of situational factors is warranted.

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Appendix A

Demographic Questionnaire

Study ID_____

Gambling and Health Survey

Today‟s Date _____

Sex ☐ Male ☐ Female

Age _____

Marital Status ☐ Married or common law ☐ Never married
☐ Widowed ☐ Separated/divorced

Residence ☐ Northern Ontario ☐ Southern Ontario

Ethnicity (Cultural Background) ☐ African/African American ☐ Asian
☐ Caucasian (white) ☐ First Nations
☐ Arabic/Middle Eastern ☐ Mixed
☐ Don‟t Know

Religious Affiliation

☐ Catholic ☐ Protestant ☐ Muslim
☐ Jewish ☐ Buddhist ☐ Chinese Traditional
☐ Other ☐ None

Strength of Religious Beliefs

☐ Very strong ☐ Somewhat strong ☐ Not strong

Education – Highest Level You Have Had the Opportunity to Complete

☐ No formal schooling ☐ Some college/university
☐ Elementary ☐ Completed college/university
☐ Some high school ☐ Post graduate degree
☐ Graduated high school

Work/Employment Status

☐ Employed full time ☐ Employed part-time ☐ Retired
☐ Unemployed (not retired) ☐ Homemaker
☐ Social assistance/disability ☐ Student

Family Income Category–total household income from all sources before taxes last year

☐ Below $20,000 ☐ $40,001-$60,000 ☐ $80,001-$100,000
$20,001-$40,000 ☐ $60,001 - $80,000 ☐ Over $100,000

How many people in your community (friends, extended family) can you rely on for social support when you need it _____

Which of the following social activities do you participate in:

☐ visiting with friends ☐ community activities ☐ social functions
☐ exercise/fitness ☐ religious services ☐ political activities
☐ volunteering ☐ dinners/movies ☐ cards/games

Current living arrangements:

☐ apartment in senior"s building ☐ apartment in non-senior"s building
☐ house/townhouse/condominium ☐ retirement home
☐ long term care/personal care home

Number of People in Household including Yourself Aged 19 or older_____

Number of People in Household that Gamble: Occasionally_____Regularly_____

(Gambling is defined as risking money on the outcome of a chance event in the hope of winning something of greater value. It can include the purchase of ***lottery tickets, scratch tickets, or pull tabs, charity raffles, playing bingo, slot machines or other casino games, internet gambling, and betting on the horses or sports games****).*

Have you ever participated in any gambling or betting activities that involve money ☐ Yes ☐ No

(If "**No**", go to Section D on page 7)

Appendix B

South Oaks Gambling Screen

B1. Please indicate which of the following types of gambling you have done in **your lifetime.** For each type, mark one answer: "not at all", "less than once a week", or "once a week or more".

Not at all	**Less than once a week**	**Once a week or more**	
☐	☐	☐	Played cards for money
☐	☐	☐	Bet on horses, dogs, or other animals (in off-track betting, at the track, or with a bookie)
☐	☐	☐	Bet on sports (parlay cards, with a bookie)
☐	☐	☐	Played dice games (including craps, over and under, or other dice games) for money
☐	☐	☐	Went to casino (legal or otherwise)
☐	☐	☐	Played the numbers or bet on lotteries
☐	☐	☐	Played bingo
☐	☐	☐	Played the stock and/or commodities market
☐	☐	☐	Played slot machines, poker machines, or other gambling machines
☐	☐	☐	Bowled, shot pool, played golf, or played some other game of skill for money

B2. What is the largest amount of money you have ever gambled with on any one day?

- ☐ never have gambled
- ☐ $1 or less
- ☐ more than $1 up to $10
- ☐ more than $10 up to $100
- ☐ more than $100 up to $1,000
- ☐ more than $1,000 up to $10,000
- ☐ more than $10,000

B3. Do (did) your parents have a gambling problem?

- ☐ both my father and mother gamble (or gambled) too much
- ☐ my father gambles (or gambled) too much
- ☐ my mother gambles (or gambled) too much
- ☐ neither one gambles (or gambled) too much

B4. When you gamble, how often do you go back another day to win back money you lost?

- ☐ never
- ☐ some of the time (less than half the time) I lost
- ☐ most of the time I lost
- ☐ every time I lost

B5. Have you ever claimed to be winning money gambling but weren‟t really? In fact, you lost?

- ☐ never (or never gamble)
- ☐ yes, less than half the time I lost
- ☐ yes, most of the time

B6. Do you feel you have ever had a problem with gambling?

- ☐ no
- ☐ yes, in the past, but not now
- ☐ yes

B7. Did you ever gamble more than you intended to? ☐ Yes ☐ No

B8. Have people criticized your gambling? ☐ Yes ☐ No

B9. Have you ever felt guilty about the way you gamble or what happens when you gamble? ☐ Yes ☐ No

B10. Have you ever felt like you would like to stop gambling but you didn‟t think you could? ☐ Yes ☐ No

B11. Have you ever hidden betting slips, lottery tickets, gambling money, or other signs of gambling from your spouse, children, or other important people in your life? ☐ Yes ☐ No

B12. Have you ever argued with people you live with over how you handle money? ☐ Yes ☐ No

B13. (If you answered "yes" to question 12:) Have money arguments ever centred on your gambling? ☐ Yes ☐ No

B14. Have you ever borrowed from someone and not paid them back as a result of your gambling? ☐ Yes ☐ No

B15. Have you ever lost time from work (or school) due to gambling? ☐ Yes ☐ No

B16. If you borrowed money to gamble or to pay gambling debts, who or where did you borrow from? (check „yes‟ or „no‟ for each)

a. from household money ☐ Yes ☐ No

b. from your spouse ☐ Yes ☐ No

c. from other relatives or friends ☐ Yes ☐ No

d. from banks, loan companies, or credit unions ☐ Yes ☐ No

e. from credit cards ☐ Yes ☐ No

f. from loan sharks ☐ Yes ☐ No

g. you cashed in stocks, bonds, or other securities ☐ Yes ☐ No

h. you sold personal or family property ☐ Yes ☐ No

i. you borrowed on your chequing account (passed bad cheques) ☐ Yes ☐ No

j. you have (had) a credit line with a bookie ☐ Yes ☐ No

k. you have (had) a credit line with a casino ☐ Yes ☐ No

Appendix C

National Opinion Research Center DSM-IV Screen for Gambling Problems

Please be open and honest in your responses

C1a. Have there ever been periods lasting 2 weeks or longer when you spent a lot of time thinking about your gambling experiences or planning out future gambling ventures or bets? ☐ Yes ☐ No

C1b. Have there ever been periods lasting 2 weeks or longer when you spent a lot of time thinking about ways of getting money to gamble with? ☐ Yes ☐ No

C2. Have there ever been periods when you needed to gamble with increasing amounts of money or with larger bets than before in order to get the same feeling of excitement? ☐ Yes ☐ No

C3a. Have you ever tried to stop, cut down, or control your gambling? ☐ Yes ☐ No

C3b. On one or more of the times when you tried to stop, cut down, or control your gambling, were you restless or irritable? ☐ Yes ☐ No

C4a. Have you ever tried but not succeeded in stopping, cutting down, or controlling your gambling? ☐ Yes ☐ No

C4b. If so, has this happened three or more times? ☐ Yes ☐ No

C5a. Have you ever gambled as a way to escape from personal problems? ☐ Yes ☐ No

C5b. Have you ever gambled to relieve uncomfortable feelings such as guilt, anxiety, helplessness, or depression? ☐ Yes ☐ No

C6. Has there ever been a period when, if you lost money gambling one day, you would return another day to get even? ☐ Yes ☐ No

C7a. Have you ever lied to family members, friends, or others about how much you gamble, or how much money you lost on gambling? ☐ Yes ☐ No

C7b. If so, has this happened three or more times? ☐ Yes ☐ No

C8. Have you ever written a bad cheque or taken money that didn‟t belong to you from family members or anyone else in order to pay for your gambling? ☐ Yes ☐ No

C9a. Has your gambling ever caused serious or repeated problems in your relationships with any of your family members or friends? ☐ Yes ☐ No

C9b. Has your gambling ever caused you to lose a job, have trouble with your job, or miss out on an important job or career opportunity? ☐ Yes ☐ No

C10. Have you ever needed to ask family members or anyone else to loan you money or otherwise bail you out of a desperate money situation that was largely caused by your gambling? ☐ Yes ☐ No

C11. How long have you been gambling ?_____

C12. Have you gambled in the **past year** ? ☐ Yes ☐ No

C13. How long has it been since you last gambled ?_____

C14. How many days have you gambled in the **past 4 weeks** ?_____

C15. About how much money have you spent in gambling-related activities in the **past 4 weeks** ?_____

Please answer the following statements as True or False

C16. I have never bought anything in a store. ☐ True ☐ False

C17. I can run a mile in less than four minutes. ☐ True ☐ False

C18. I have never brushed or cleaned my teeth. ☐ True ☐ False

C.19 I have never felt sad. ☐ True ☐ False

Appendix D

Short Form – 36 Health Survey (Modified)

D1. **In general, would you say your health is**: (Please tick **one** box.)

☐ Excellent ☐ Very Good

☐ Good ☐ Fair

☐ Poor

D2. **During the <u>past 4 weeks</u>, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?** (Please tick **one** box.)

☐ Not at all ☐ Slightly

☐ Moderately ☐ Quite a bit

☐ Extremely

D3. **How much <u>physical</u> pain have you had during the <u>past 4 weeks</u>**? (Please tick **one** box.)

☐ None ☐ Very mild

☐ Mild ☐ Moderate

☐ Severe ☐ Very Severe

D4**. During the <u>past 4 weeks</u>, how much did <u>pain</u> interfere with your normal work (including both work outside the home and housework)?** (Please tick **one** box.)

☐ Not at all ☐ A little bit

☐ Moderately ☐ Quite a bit

☐ Extremely

D5. **During the <u>past 4 weeks</u>, how much of the time has your <u>physical health or emotional problems</u> interfered with your social activities** (like visiting with friends, relatives, etc.) (Please tick **one** box.)

☐ All of the time ☐ Most of the time

☐ Some of the time ☐ A little of the time

☐ None of the time

D6. **How TRUE or FALSE is <u>each</u> of the following statements for you?**

	(Please check one box on each line.)	**Definitely True**	**Mostly True**	**Don't Know**	**Mostly False**	**Definitely False**
6 (i)	I seem to get sick a little easier than other people	☐	☐	☐	☐	☐
6 (ii)	I am as healthy as anybody I know	☐	☐	☐	☐	☐
6 (iii)	I expect my health to get worse	☐	☐	☐	☐	☐
6 (iv)	My health is excellent	☐	☐	☐	☐	☐

D7. **Do you experience any of the following health concerns**:

Back problems	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Bone problems or painful joints	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Loss of balance	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Muscle cramps or sore muscles	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Cardiac or heart problems	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Hearing or ear problems	☐ Yes, most of the time	☐ Yes, some of the time	☐ No

Vision and eyesight problems	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Breathing problems	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Arthritis	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Diabetes	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Stomach or bowel problems	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Memory problems	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
High cholesterol	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
High blood pressure	☐ Yes, most of the time	☐ Yes, some of the time	☐ No
Other _____	☐ Yes, most of the time	☐ Yes, some of the time	
Other _____	☐ Yes, most of the time	☐ Yes, some of the time	

Appendix E

Alcohol Use Disorders Identification Test

E1. **How often do you have a drink containing alcohol**?

☐ Never ☐ monthly or less ☐ 1-4 times a month
☐ 2-3 times a week ☐ 4 or more times a week

(If "**Never**", go to Section F, page 11)

E2. **How many standard drinks containing alcohol do you have on a typical day when you are drinking?**

☐ 1 or 2 ☐ 3 or 4 ☐ 5 or 6
☐ 7 to 9 ☐ 10 or more

E3**.How often do you have 6 or more standard drinks on one occasion?**

☐ Never ☐ Less than monthly ☐ Monthly
☐ Weekly ☐ Daily or almost daily

E4. **How often during the last year have you found that you were not able to stop drinking once you had started?**

☐ Never ☐ Less than monthly ☐ Monthly
☐ Weekly ☐ Daily or almost daily

E5. **How often during the last year have you failed to do what was normally expected from you because of your drinking?**

☐ Never ☐ Less than monthly ☐ Monthly
☐ Weekly ☐ Daily or almost daily

E6. **How often during the last year have you needed an alcoholic drink in the morning to get yourself going after a heavy drinking session?**

☐ Never ☐ Less than monthly ☐ Monthly
☐ Weekly ☐ Daily or almost daily

E7. **How often during the last year have you had a feeling of guilt or remorse after drinking?**

☐ Never ☐ Less than monthly ☐ Monthly
☐ Weekly ☐ Daily or almost daily

E8. **How often during the last year have you been unable to remember what happened the night before because you had been drinking?**

☐ Never ☐ Less than monthly ☐ Monthly
☐ Weekly ☐ Daily or almost daily

E9. **Have you or someone else been injured as a result of your drinking?**

- ☐ No
- ☐ Yes, but not in the last year
- ☐ Yes, during the last year

E10. **Has a relative or friend, doctor, or other health worker been concerned about your drinking or suggested you cut down?**

- ☐ No
- ☐ Yes, but not in the last year
- ☐ Yes, during the last year

Appendix F

Use of Prescription Medication

F1**.** In the past year, have you taken any prescription medication? ☐ Yes ☐ No

(If "**No**", go to section G, page 12)

F2. In the past year, have you taken any prescription medication to help you sleep? ☐ Yes ☐ No

F3. In the past year, have you taken any prescription medication to relieve pain? ☐ Yes ☐ No

F4. In the past year, have you taken any prescription medication for depression? ☐ Yes ☐ No

F5**.** In the past year, have you taken any prescription medication for anxiety or panic attacks? ☐ Yes ☐ No

F6. In the past year, have you taken any prescription medication for blood pressure? ☐ Yes ☐ No

F7. In the past year, have you taken any prescription medication for high cholesterol? ☐ Yes ☐ No

F8. In the past year, have you taken any prescription medication for your prostate or for hormone replacement? ☐ Yes ☐ No

F9. In the past year, have you taken any prescription medication for water retention? ☐ Yes ☐ No

F10.In the past year, how many other prescription medications have you taken?

_____

F11. During the past year did you ever take more medication than prescribed? ☐ Yes ☐ No

If yes, what was the name of the medication?_____

Appendix G

Hospital Anxiety and Depression Scale

Read each statement and mark the box that comes closest to how you have been feeling in the past week. Your immediate reaction will probably be more accurate than a long, thought-out response.

G1**. I feel tense or „wound up":**

☐ Most of the time ☐ A lot of the time

☐ Time to time. Occasionally. ☐ Not at all

G2**. I still enjoy the things I used to enjoy:**

☐ Definitely as much ☐ Not quite so much

☐ Only a little ☐ Hardly at all

G3. **I get a sort of frightened feeling as if something awful is about to happen:**

☐ Very definitely and quite badly ☐ Yes, but not too badly

☐ A little, but it doesn"t worry me ☐ Not at all

G4**. I can laugh and see the funny side of things:**

☐ As much as I always could ☐ Not quite so much now

☐ Definitely not so much now ☐ Not at all

G5. **Worrying thoughts go through my mind:**

☐ A great deal of the time ☐ A lot of the time

☐ From time to time but not too often ☐ Only occasionally

G6**. I feel cheerful:**

☐ Not at all ☐ Not often

☐ Sometimes ☐ Most of the time

G7. **I can sit at ease and feel relaxed:**

☐ Definitely ☐ Usually

☐ Not often ☐ Not at all

G8. **I feel as if I am slowed down:**

☐ Nearly all the time ☐ Very often

☐ Sometimes ☐ Not at all

G9**. I get a sort of frightened feeling like "butterflies" in the stomach:**

☐ Not at all ☐ Occasionally

☐ Quite often ☐ Very often

G10.**I have lost interest in my appearance:**

☐ Definitely ☐ I don‟t take so much care as I should

☐ I may not take quite as much care ☐ I take just as much care as ever

G11.**I feel restless as if I have to be on the move:**

☐ Very much indeed ☐ Quite a lot

☐ Not very much ☐ Not at all

G12.**I look forward with enjoyment to things:**

☐ As much as I ever did ☐ Rather less than I used to

☐ Definitely less than I used to ☐ Hardly at all

G13.**I get sudden feelings of panic:**

☐ Very often indeed ☐ Quite often

☐ Not very often ☐ Not at all

G14.**I can enjoy a good book or radio or TV programme:**

☐ Often ☐ Sometimes

☐ Not often ☐ Very seldom

G15.**I have never talked to anyone by telephone.** ☐ True ☐ False

G16.**I make all my own clothes and shoes.** ☐ True ☐ False

G17.**I have never had any hair on my head.** ☐ True ☐ False

G18.**I have never ridden in an automobile.** ☐ True ☐ False

Appendix H

Satisfaction With Life Scale

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by circling the appropriate number on the line following that item.

1. **In most ways, my life is close to my ideal.**

1	2	3	4	5	6	7
strongly disagree	*disagree*	slightly disagree	*neither agree nor disagree*	slightly agree	*agree*	strongly agree

2. **The conditions of my life are excellent.**

1	2	3	4	5	6	7
strongly disagree	*disagree*	slightly disagree	*neither agree nor disagree*	slightly agree	*agree*	strongly agree

3. **I am satisfied with my life.**

1	2	3	4	5	6	7
strongly disagree	*disagree*	slightly disagree	*neither agree nor disagree*	slightly agree	*agree*	strongly agree

4. **So far I have gotten the important things I want in life.**

1	2	3	4	5	6	7
strongly disagree	*disagree*	slightly disagree	*neither agree nor disagree*	slightly agree	*agree*	strongly agree

5. **If I could live my life over, I would change almost nothing.**

1	2	3	4	5	6	7
strongly disagree	*disagree*	slightly disagree	*neither agree nor disagree*	slightly agree	*agree*	strongly agree

Appendix I

Letter of Introduction

Dear Potential Participants

Thank you for your interest in our efforts to obtain research participants for this study on gambling behaviour and health. This study is being conducted by Emily King, Ph.D. candidate in Clinical Psychology at Lakehead University and supervised by Dr. Dwight Mazmanian, Associate Professor of Psychology at Lakehead University.

Recent studies indicate that gambling has become a very popular activity among older adults. The relationships between gambling activities and factors such as health and well-being have not been systematically studied in this group. This study will explore aspects of health, well-being, and social functioning of adults age 50 and older across a range of gambling activities. A survey comprised of measures of gambling behaviour, health, and life satisfaction has been developed. It is anticipated that the survey will take about 30 minutes to complete. There are no known physical or psychological risks associated with participating in this study.

Participation in this study is completely voluntary and anonymous. No identifying information will be collected. You are free to withdraw at any time or leave questions blank that you do not understand or do not wish to answer. However, answering all of the items would be greatly appreciated as this would be most useful in conducting this research. Completed surveys will be kept in secure storage at Lakehead University for seven years. Only the researcher and Dr. Mazmanian will have access to the data. It is the researcher‟s intention to publish the results and make presentations on the research findings. A summary of the results will be available by mail or email to interested individuals who provide their name and mailing address or email address to the researcher.

If you would like to participate, please read and sign the attached Consent Form prior to completing the survey. To protect your anonymity, the Consent Form will be detached from the survey. In appreciation for completing the survey, your name will be entered into a random draw for a $50 gift certificate redeemable at a local restaurant.

Thank you for your interest in this study.

Emily King
Ph.D. Candidate
Clinical Psychology

Email: ghstudy@lakeheadu.ca

Dwight Mazmanian, Ph.D., C. Psych.
Dissertation Supervisor
Department of Psychology
807-343-8257
Email: dwightmazmani@lakeheadu.ca

The Lakehead University Research Ethics Board can be reached at 807-343-8283.

Appendix J

Consent Form

CONSENT FORM

Thank you for your interest in this research project on gambling behaviour and health. This study is being conducted by Emily King, Ph.D. candidate in Clinical Psychology at Lakehead University and supervised by Dr. Dwight Mazmanian, Associate Professor of Psychology at Lakehead University.

Recent studies indicate that gambling has become a very popular activity among older adults. The relationships between gambling activities and factors such as health and well-being have not been systematically studied in this group. This study will explore aspects of health, well-being, and social functioning of adults age 50 and older across a range of gambling activities. A survey comprised of measures of gambling behaviour, health, and life satisfaction has been developed. It is anticipated that this survey will take about 30 minutes to complete. Completed surveys will be kept in secure storage at Lakehead University for a minimum of 5 years. Only the researcher and Dr. Mazmanian will have access to the data.

- I understand that my participation in this study is completely voluntary and that I can withdraw from the study at any time without loss or penalty.
- I understand that no identifying information will be collected, and that my responses will be completely anonymous.
- I understand that I may leave questions blank that I do not understand or do not wish to answer.
- I understand that there are no known physical or psychological risks associated with participating in this study.

If you decide to participate, you are encouraged to be honest and accurate in sharing your personal information. Answering all of the items would be sincerely appreciated as this would be most useful in conducting this research. It is the researcher‟s intention to publish the research results and make presentations on the findings. A summary of the results will be available by mail or email to interested individuals who provide their name and mailing address or email address to the researcher. As a token of our appreciation for completing the survey, your name will be entered into a random draw for a $50 gift certificate redeemable at a local restaurant.

If you have any questions, you may ask them now, or contact Emily King at (807) 343-8943 or by email at ghstudy@lakeheadu.ca.

Statement of Consent

I have read and understand the above information. I consent to participation in this survey.

_____	_____	_____
Printed Name	Signature	Today‟s Date

Appendix K

Debriefing Form

DEBRIEFING FORM

Thank you for your participation in this research project on gambling behaviour and health.

We hope that this study will further our understanding of the associations between gambling behaviours and physical and emotional health and well-being in adults aged 50 and over. A summary of the results will be available by mail or email to interested individuals who provide their name and mailing address or email address to the researcher.

If you have specific questions about the survey, you may contact Emily King (807-343-8943), Dr. Dwight Mazmanian, at the Department of Psychology, Lakehead University (807-343-8257), or email ghstudy@lakeheadu.ca.

If completing the survey has raised any issues about gambling that you would like to discuss, you may contact the Sister Margaret Smith Centre, Problem Gambling Program, at (807) 343-2425, or toll-free at 1-866-346-0463, or the Ontario Problem Gambling Helpline at 1-888-230-3505.

If you are distressed or have other personal issues you would like to discuss, you may contact the Crisis Response Program, Canadian Mental Health Association, at (807) 346-8282.

If you would like to learn more about gambling in older adults, the following are a few suggested articles:

(1) McNeilly, D., & Burke, W. (2000). Late life gambling: the attitudes and behaviors of older adults. *Journal of Gambling Studies, 16*(4), 393-414.

(2) McNeilly, D., & Burke, W. (2001). Gambling as a social activity of older adults. The *International Journal of Aging and Human Development, 52*(1), 19-28.

(3) Vander Bilt, J., Dodge, H. Pandav, R., Shaffer, H., & Ganguli, M. (2004). Gambling participation and social support among older adults: a longitudinal community study. *Journal of Gambling Studies, 20*(4), 373-390.

Appendix L

Prescription Medication Use by Gambling Group

Prescription Medication Use (%) by Gambling Group

Medication	Non-Gamblers (n = 32)	Recreational Gamblers (n = 180)	Problem Gamblers (n = 26)
Prescription Drugs	84.4	87.0	96.2
Sleep	11.1	28.0	28.0
Pain	63.0	64.7	80.8
Depression	25.9	14.0	16.0
Anxiety	7.7	11.5	20.0
Blood Pressure	50.0	52.6	60.0
Cholesterol	29.6	44.9	48.0
Prostate/Hormonal	8.0	9.2	4.0
Water Retention(Diuretic)[t]	23.1	18.8	40.0
More than Prescribed	4.0	2.5	4.0

[t] Trend; Medication use by problem gamblers higher than recreational gamblers

Appendix M

Relationship of Age to Problem Gambling Behaviours

Relationship of Age to Problem Gambling Behaviours

	Mean Age of Gamblers Not Endorsing Behaviour	Mean Age of Gamblers Endorsing Behaviour	
Hiding Gambling from Others**	66.63 (*SD* = 9.07)	58.75 (*SD* = 8.36)	*t* (241) = 3.37
Arguing about Money***	67.31 (*SD* = 9.03)	58.50 (*SD* = 5.67)	*t* (64.04) = 7.62
Money Arguments about Gambling**	66.47 (*SD* = 9.05)	56.80 (*SD* = 6.37)	*t* (241) = 3.34
Borrowing $ from Spouse*	66.73 (*SD* = 8.97)	59.70 (*SD* = 8.62)	*t* (204) = 2.42
Borrowing $ from Friends/Relatives**	66.76 (*SD* = 8.96)	57.00 (*SD* = 6.97)	*t* (204) = 3.04

* Difference significant at $p < .05$
** Difference significant at $p < .01$
*** Difference significant at $p < .001$