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An Investigation of the Application of Self-Determination Theory to Potentially Problematic Behaviours.

Test of an Illustrative Model: Gambling Behaviour

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Thesis submitted to the School of Graduate Studies and Research
of the University of Ottawa in partial fulfilment of the requirements
for the degree of Doctor of Philosophy

May 2001

This thesis is dedicated to my friends and family for their support and patience over the years it has taken to complete this project.

ACKNOWLEDGEMENTS

I would like to thank Dr. Luc G. Pelletier for consenting to supervise this thesis. His support of my autonomy together with his direction and patience (even in the face of tears) allowed me to achieve a goal that I once believed was beyond my capabilities. His encouragement in the face of hurdles fostered the persistence that earned me the affectionate nickname of "The Pit Bull". I would also like to thank my labmates, in particular Stephanie Dion and Chantal Sequin, for sharing their knowledge and experience and providing emotional support and a feeling of relatedness. Stephanie and I travelled the the road to a doctoral thesis together and my journey would have been desolate without her. Special thanks goes to Aubrey and Debra Zidenberg for their permission to contact their clients for data collection. And finally, I would like to thank my committee members Dr. Jo Wood, Dr. Catherine Lee, and Dr. John Hunsley for their time and advice.

ABSTRACT

The purpose of this research was to first, investigate the application of Deci and Ryan's (1990) Self-Determination Theory (SDT) to a potentially problematic behaviour, and second, to investigate the relationship between gambling motivation and consequences. The SDT framework has been used to investigate the relationship between motivation and consequences in domains considered to be functional activities and to have positive consequences. It is unknown whether postulates of the SDT can be extended to activities that are potentially problematic and therefore may be associated negative consequences. The domain of gambling was chosen for this research because of its growing popularity and awareness of the negative consequences that can be associated with this behaviour. Vallerand's (1997) hierarchical model of self-determination and the previously investigated domain of leisure were incorporated into a gambling model to allow comparison of the results of this study with results previously found in other populations.

A pilot study explored the relationships between gambling motivation and gambling consequences. The Gambling Motivation Scale (GAMS; Chantal, Vallerand, & Vallieres, 1995), the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987), the Rosenberg Self-esteem Scale (RSE; Rosenberg, 1979) and the Self-Rating Depression Scale, (Zung, 1965) were completed by 237 men and women from the general and university populations. Results did not completely support or refute the tenets of Self-Determination Theory. Study 1 tested a hierarchical model of leisure and gambling activities, headed by global self-determination, in a sample of men and women (N=215) who had gambled in the last year. Respondents completed the Global Self-Determination

Scale (Guay, et al., 1996), the Leisure Motivation Scale (Pelletier, Green-Demers & Dion, 1998), the GAMS, a measure of leisure activity consequences, the SOGS, the RSE, the Centre for Epidemiologic Studies Depression Scale (Radloff, 1977) and the Satisfaction with Life Scale (Diener, Emmons, Larson, & Griffin, 1985). Based on SOGS scores, 16.6% of the sample met criteria for possible problem gambling. Results from structural equation modelling analysis (with LISREL) support the use of Vallerand's (1997) hierarchical domain specific theory and SDT in research with adaptive behaviours. Results of the gambling side of the model provide limited support for the use of these theories in research with potentially problematic activities. There is some evidence that motivation plays a role in the development of problem gambling and that global self-determination moderates the relationship between gambling involvement and problem gambling.

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INTRODUCTION

The goals of this research were, first, to examine the validity of using Self-Determination Theory to explain potentially problematic behaviours, and second, to propose and test a model of gambling behaviour. Previous research has demonstrated the utility of the Self-Determination Theory in explaining the relationship between motivation for functional activities and the consequences of these activities. It has been found to distinguish between different types of motivations, their impact on regulation of behaviour, and the various consequences associated with different motivations. This research attempted to verify whether postulates from previous research on Self-Determination Theory may be applied to a potentially dysfunctional context. Gambling was chosen because of its growing popularity and awareness of the negative consequences that can be associated with this behaviour. The application of a theoretical model to gambling behaviour would allow us to investigate the possible relationship between different forms of regulation of gambling, the frequency of gambling behaviour and gambling consequences. This understanding could shed light on the processes involved in gambling problems, thereby leading to potential insights concerning future research and possibly future interventions.

The terms problem, pathological and compulsive are used in the literature to describe gambling behaviour that results in difficulties for the individual. From the research literature, it appears that there is a continuum from what is termed "social"

gambling, through "problem" gambling, to the more serious "pathological" gambling. Gambling behaviour and its consequences that meet the criteria set out in the Diagnostic and Statistical Manual IV is termed pathological gambling. It is characterized as progressive, persistent, and recurrent maladaptive gambling behaviour that disrupts personal, family, or vocational pursuits (American Psychiatric Association, 1994; Canadian Foundation on Compulsive Gambling [CFCG] 1998). The terms pathological and compulsive are synonymous. In general, pathological gambling is the designation more commonly used by the professional community, whereas the term compulsive is often used by the lay community. The terms pathological, compulsive, and addictive are used interchangeably in the literature (Murray, 1993).

The term problem gambling is used to describe gambling behaviours and consequences that do not fit the criteria of the DSM-IV but also cause the individual personal, familial, financial, or social problems. A problem gambler could be defined as someone who gambles, and has encountered one or more problems resulting from their gambling activities (Rosenthal & Lorenz, 1992).

A review of the estimates of current problem and pathological gambling in Canada (National Council of Welfare, 1996) revealed percentages of .08% to 1.37% considered pathological gamblers, and 1.9% to 4.0% problem gamblers. Lifetime estimates for pathological gambling ranged between 1.2% to 2.7% (NCW, 1996). Lifetime, problem gambling estimates, ranged from 2.6% to 6.0% (NCW, 1996). Combining the two categories, we estimate that 3.6% to 8.6% have had problems with gambling at some time

in their lives. These percentages may appear small, but they represent somewhere between 600,000 and 1.2 million Canadians.

Although several studies have examined the characteristics of problem gamblers, few have tried to predict who, in the normal population, might develop the problem. Most have adopted the approach of investigating how identified problem gamblers differ from recreational gamblers or non-gamblers. A few studies have examined motivation for gambling, but none have examined the associations between motivation for gambling and problem gambling. To identify what factors may put a person at risk for developing problem gambling this study is designed, based on prior studies related to a variety of behaviours, to examine gambling behaviour according to a theory of self-regulation. More specifically it is postulated that:

A) People gamble for a variety of reasons, these reasons could be classified according to a set of processes corresponding to forms of regulation of the behaviour, and these forms of regulation could be distinguished along a continuum of self-determination.

B) Because these forms of regulation of gambling behaviour could be placed on a self-determination continuum, they could lead to specific predictions regarding gambling behaviour.

It was proposed that to understand how motivation could be associated with problem gambling a self-determination model of gambling behaviour should be considered. This research examined people's motivation for engaging in gambling and how different sets of motivations lead to different consequences.

This thesis is composed of three sections: the Introduction, a Pilot Study, and Study 1. In the first section, the Introduction, past research on gambling relevant to this study is presented, followed by evidence for relationships between motivation and gambling consequences. Then Deci and Ryan's (1990) theory of motivation is described. The limitations of the relationship between Self-Determination Theory and pathological behaviour are then discussed. Vallerand's (1997) Hierarchical Model of Motivation that extends Deci and Ryan's (1990) theory is reviewed and incorporated into the proposed self-determination model to address limitations of Self-Determination Theory with regard to pathological behaviour. Previous research applying Self-Determination Theory to gambling behaviour is presented, and limitations of this research is discussed. A hierarchical model of motivation balancing gambling behaviour with a behaviour previously examined using Self-Determination Theory, that of leisure, is outlined. A preliminary study (Pilot Study) investigating the relationship between self-determination, gambling behaviour, and gambling consequences follows. In Study 1 the hierarchical motivational model was tested. Implications of the results, limitations of the research, and possible directions for future research as they apply to Self-Determination Theory and to gambling, are addressed in the discussion of Study 1.

Gambling Background

Gambling has been broadly defined as "the wager of any type of item or possession of value upon a game or event of uncertain outcome in which chance, of variable degree, determines such outcome" (Bolen & Boyd, 1978, p. 619). Card games

for money, raffles and bingo have long been a part of Canadian social life, but the nature of gambling changed radically with the legalization of gambling in 1969 and the arrival of government regulated gambling (National Council of Welfare [NCW] 1996). The gambling business burgeoned. The estimated total wagering on all forms of legal gambling in Canada was $20 billion a year in 1995 (NCW, 1996). In 1999, $8.1 billion of profit was generated from some form of non-charity gambling activity, three times the $2.7 billion of seven years earlier (Fast facts - Canada, 2000, Spring). Because gambling activities are government regulated, gambling provides millions of dollars of revenue for provincial governments. In 1995, Statistics Canada estimated that net gambling revenue to governments from lotteries, casinos and Video Lottery Terminals was nearly $4.6 billion (NCW, 1996). With profits such as these one can realistically assume that gambling is here to stay.

Because the majority of the population appears able to engage in the activity with no adverse consequences, it can be argued that the activity itself is not inherently injurious. Social gambling can be recreational and provide exciting and exhilarating entertainment. On one end of the continuum are social gamblers who limit the frequency of gambling, the time and money spent, and suffer no adverse repercussions. They can quit gambling any time, whether they are winning or losing (Custer, 1984). That is not to say that the social gambler does not occasionally fail to regulate his or her gambling to meet some previously set standard, such as a limit on time or money spent. However, these occasional lapses in self-control do not result in dire consequences. On the other end of the continuum, there

are gamblers who will "risk their reputation, their family's security, their life's savings, their work, their freedom, or their safety on the turn of a card, a roll of the dice, or the legs of a horse" (Custer, 1982, p.108). They are constantly preoccupied with gambling and are unable to resist the urge to engage in this behaviour despite extreme negative consequences.

The negative consequences of problem gambling can be personal, social, professional, emotional, financial, and legal (see Stirpe, 1995, for a review). Anxiety, depression, a decline in self-esteem, and suicidal thoughts have been reported by gamblers seeking help (Frank, Lester, & Wexler, 1991; Linden, Harrison, Pope, & Jonas, 1986; Lorenz & Yaffee, 1986). Spouses and children of the problem gambler are affected by social, psychological, and economic stresses that result from the gambling activity (Lorenz & Shuttlesworth, 1983; Lorenz & Yaffee, 1988). Problem gambling also impacts on the community and society. Studies have reported that when all legal sources of money have been exhausted, some people with problem gambling turn to crime (Lesieur & Blume, 1991; Lesieur & Rosenthal, 1991; Peck, 1986; Rosenthal, 1992; Rosenthal & Lorenz, 1992). So it would seem that while the problem is limited to a small percentage of the population the personal consequences and impact on others are severe. The question remains, how do we predict who will be among that small percentage?

Gambling Research

Despite the long history of gambling, its examination by social scientists began relatively recently. Until the late 1960s there existed only case studies in the literature,

predominantly written by psychoanalysts. In response to increased gambling and reports of chronic gamblers, theoretical papers, papers about various forms of therapy, and papers describing empirical studies began to appear in the early 1970s. The inclusion of pathological gambling as a distinct syndrome in the DSM-III in 1980 heralded the beginning of a more systematic investigation of this disorder. Research on problem gambling has been conducted in England and Australia, and Canada and the United States. Until recently, most of the research has been with members of Gamblers Anonymous and individuals presenting for treatment.

Who Gambles?

A telephone survey of 1,030 Ontario adults on gambling behaviour provides an approximation of the demographics of people who choose to gamble (Ferris, Stirpe, & Ialomiteanu, 1996). Most Ontario adults (84%) participated in some form of gambling activity in the year preceding the survey. Rates of gambling on up to three or four activities for men and women of ages between 18 and 65+ were similar. Men between the ages of 18 and 39 were more likely to gamble on five or more activities and to have spent more money than other age groups. Preferences for lotteries, bingo, horse races, casino, cards, video lotteries and sports were assessed. Compared to women, men were more likely to participate in card playing and sports betting. The only activity in which women were reliably more likely to have participated was bingo. When participation in gambling activities was examined by educational level, no significant trends were found, however those in higher educational categories were less likely to gamble at all. There was an

overall trend for young men with less education to participate in more forms of gambling, more frequently, and spend more money than other groups. There were no differences related to marital status (Ferris et al., 1996).

Differences Between Problem and Non-problem Gamblers

The recent provincial surveys that measured the extent of gambling problems also attempted to provide some insight into the demographics of problem gamblers. The South Oaks Gambling Screen (SOGS, Lesieur & Blume, 1987) was used to identify individuals with problems. According to the criteria of this screen, respondents scoring 3 and 4 points are classified as "problem gamblers" and those scoring 5 or more points are classified as "probable pathological gamblers". According to these surveys, there is no clear pattern of the individual most likely to be a problem gambler.

When gambling problems between men and women were compared, results varied. Five of the six surveys (British Columbia, Alberta, Saskatchewan, Quebec, New Brunswick) that reported lifetime prevalence rates found that problem/pathological gamblers are somewhat more likely than are non-problem respondents to be male. Two surveys (Ontario, Saskatchewan) reported men to be more likely than women to have current gambling problems, and three reported no differences (British Columbia, Alberta, Manitoba).

Comparison of problems by age group and marital status also revealed conflicting results. Three surveys (British Columbia, Alberta, Saskatchewan) reported that problem/pathological gamblers are significantly more likely to be under 30 than are non-

problem respondents. Two surveys (New Brunswick, Nova Scotia) reported that there is no difference with respect to age. Two surveys (Ontario, Quebec) reported that there are two separate groups, one younger and one older, that are more likely to report gambling problems. When problem/pathological gamblers were compared to non-problem gamblers on marital status, five surveys (British Columbia, Alberta, Ontario, Saskatchewan, New Brunswick) reported that problem/pathological gamblers are more likely to be unmarried, and three (Manitoba, Nova Scotia, Quebec) reported no significant differences.

The previously cited provincial surveys did not compare problem and non-problem gamblers on education or income level. However, Ferris et al., (1996), who also employed the SOGS (Lesieur & Blume, 1987) in their survey of gamblers in Ontario, included measures of education and income in their study. This study found that educational level did not differentiate individuals without gambling problems from pathological or problem gamblers. Family income was not significantly related to gambling problems, although there was a trend for higher income respondents to report more problems (Ferris et al., 1996).

The results of these surveys suggest that although younger, unmarried males may be more likely to report problem gambling behaviour, no one is immune. It seems that people of both genders, of all ages, marital status, education and income bracket may experience difficulties with gambling behaviour. The foregoing surveys provide descriptive information but do not offer explanations of why people gamble or have problems with gambling.

Types of Gambling

The most popular forms of gambling in Ontario are: lottery tickets (91%), instant lotteries (71%), bingo (19%), racetrack (15%), Sport Select (12%), video lottery (4%), and betting through a bookmaker (3%) (CFCG, 1993). It has been suggested that problem gambling is more likely to develop for some forms of gambling than for others. Forms of gambling in which the reinforcement is rapidly determined have been proposed to be more problematic than slower return games (Walker, 1992, p. 117). It has also been suggested that problem gamblers prefer games that involve a dimension of skill (NCW, 1996). There is little research to support these assertions.

In a study of 172 gamblers admitted for inpatient gambling treatment, 37% preferred racetracks, 21% preferred sports, casinos (13%), financial gambling (7%), lottery (5%), poker machines (10%), and 13% preferred other forms not listed (Ciarrocchi & Richardson, 1989). The most popular forms of gambling among problem gamblers calling a compulsive gambling hotline in the U.S. were lotteries (54%), sports betting (44%), card playing (23%), horse and/or dog racing (20%), slot machines (19%), and bingo (13%) (Lorenz, 1990 cited in Stirpe, 1995). The results of these studies suggest that all forms of gambling can pose potential problems for some people.

Motivations for Gambling

Problem and non-problem gamblers share many reasons for gambling (see Table 1). The most commonly cited reasons are: for fun or excitement, to win money, to support worthy causes. There is evidence that some motivations are associated with

Table 1

Reasons for Gambling in Alberta Among Problem and Non-Problem Gamblers, 1993

	Problem and Pathological Gamblers	Non-Problem Gamblers
Number in Survey	153	1,519
For fun or excitement	90%	78%
To win money	84%	71%
For excitement or challenge	79%	58%
To support worthy causes	60%	72%
To do things with friends	44%	33%
Out of curiosity	43%	39%
Because I am good at it	34%	10%
As a hobby	28%	22%
As a distraction from everyday problems	24%	8%
To be alone	12%	2%

Note. From Gambling in Canada (p. 28), by the National Council of Welfare, Winter 1996

problem gambling. Reports from clinicians and research on motivation for gambling suggest that problem gamblers often fantasize about becoming a "big shot" (Blaszczynski & McConaghy, 1989; Stirpe, 1995). Problem gamblers have been reported to be more likely than non-problem gamblers to endorse gambling for excitement or escape (Blaszczynski & McConaghy, 1989; Corless & Dickerson, 1989; Lesieur & Blume, 1991). Some studies suggested that gambling in the hopes of winning money is descriptive of the non-problem gambler (CFCG, 1993), whereas others attributed this motivation to the problem gambler (Blaszczynski & McConaghy, 1989; Coreless &

Dickerson, 1989). No one motive has been consistently identified among problem gamblers.

The results of the surveys on the demographics of problem/pathological gamblers suggest that men and women of various ages, married or single, of any educational level or income bracket are at risk of developing difficulties in regulating their gambling activities. In addition, no specific gambling activities have been identified as more risky than others in the development of problem behaviours. Although some motivations have been found to be associated with problem gambling, no theoretical framework has been applied to assist in interpreting these findings.

The Self-Determination framework has been used in many settings to investigate people's motivations in different domains, and the consequences associated with different motivations. In this thesis it was proposed that it would be useful in contributing to our understanding of the issues related to problem gambling. First, it distinguishes between different types of motivation that can have an impact on regulation of gambling behaviour. Second, it outlines various consequences associated with different types of motivation. And third, it presents hypotheses regarding conditions that should hinder or facilitate regulation of gambling.

Theory of Self-Determination

Deci and Ryan (1990) proposed that behaviour is regulated by three types of motivation: intrinsic, extrinsic, and amotivation. Intrinsically motivated behaviours are undertaken out of interest, free-choice, and are optimally challenging. They are engaged in

for the simple pleasure of doing them rather than for material rewards or because of external constraints. Extrinsically motivated behaviours are those engaged in for instrumental reasons, such as receiving a reward or avoiding something aversive. Deci and Ryan (1990) proposed that there are four types of extrinsic motivation classified along a continuum of increasing self-determination: external regulation, introjection, identification, and integrated regulation.

External regulation occurs when behaviours are controlled by external forces such as material reward. Introjected behaviours have been internalized, and the former external source of motivation is no longer needed to initiate a behaviour. Instead these behaviours are regulated by internal pressures emanating from the self, such as the avoidance of guilt or the opportunity for egoistic pride. Identified regulation occurs when the person values the behaviour and has accepted responsibility for the regulatory process. Identified behaviours are considered more self-determined than external or introjected behaviours. Integrated regulation develops when behaviours are congruent with one's values and consistent with one's self-schema. Intrinsic motivation and integrated regulation are similar in that they are volitional and expressive of the person. However, they differ in that intrinsic motivation is characterized by interest in the activity itself, whereas integrated regulation is characterized by the activity being instrumental in some fashion.

The last type of motivation for behaviour is amotivation. Amotivated behaviours are carried out with no clear sense of a relationship between the behaviour and the

outcome.

The Simplex Pattern

The Theory of Self-Determination postulates a simplex structure of correlations between sub-scales. Higher correlations between the sub-scales occupying adjacent positions represent more similarity between higher self-determination sub-scales than with lower self-determination sub-scales, and the reverse. For example, amotivation represents the form of motivation with the least self-determination and is located at opposite ends of the continuum to intrinsic motivation which represents the highest form of self-determination. Identification is the next highest form of self-determined motivation whereas external regulation is more self-determined than amotivation. Identified regulation lies in the middle of the continuum, between identified and external regulations. For example, in the construction and validation of the French version of the Motivation for Leisure Scale, Pelletier et al. (1996) found the intrinsic motivation for knowledge was most highly correlated with identified regulation (.68) and negatively correlated with amotivation (-.22). The correlation between intrinsic motivation for knowledge and external regulation was higher than amotivation (-.09), and the correlation with introjected fell in the middle (.30).

Consequences of Motivation

Deci and Ryan (1990) hypothesized that there are diverse consequences associated with the different types of motivation. Because the six types of motivation are considered to be on a continuum of self-determination, and because self-determination is associated

with enhanced psychological functioning, these authors proposed a corresponding pattern of consequences. Intrinsic, integrated, and identified regulation are proposed to be associated with more positive consequences, whereas introjected, external, and amotivated regulation are expected to be associated with more negative consequences.

This pattern of results has been found in studies in a variety of domains. For example, Pelletier et al. (1996) found that intrinsic leisure motivation to know was most highly correlated with positive emotions (.21), followed by identified regulation (.19). Leisure amotivation was more negatively correlated with positive emotions (-.31) than external regulation (-.19). The introjected leisure regulation correlation with positive emotions was intermediate (.18) to the two more and two less self-determined motivations. An assessment of motivation for schoolwork found that identification and intrinsic regulation were positively correlated with enjoyment of school, expenditure of effort, and proactive coping (Ryan & Connell, 1989; Vallerand, Blais, Briere, & Pelletier, 1989). In an assessment of prosocial self-regulation, the more autonomous styles were associated with empathy, and moral reasoning (Ryan & Connell, 1989). More self-determined reasons for cohabitating have been related to dyadic adjustment and partner happiness and satisfaction (Blais, Sabourin, Boucher, & Vallerand, 1990). Intrinsic motivations have also been associated with greater persistence in school and sports (Pelletier, Fortier, Vallerand, & Briere, in press; Vallerand, Fortier, & Guay, 1997). In summary, more self-determined styles have been associated with greater psychological health, a sense of daily well-being, and regulation of specific behaviours in a way that leads to positive outcomes.

Less self-determined styles of regulation have been associated with less successful outcomes of behaviour. For example, less autonomous styles have been correlated with anxiety and poor coping (Ryan & Connell, 1989), less satisfaction and more frustration with life (Deci & Ryan, 1990; Ryan, 1995) and more dropout from school behaviour (Vallerand, Fortier, & Guay, 1997; Vallerand & Bissonnette, 1992).

Experimental research contributes evidence that motivation actually causes consequences. Experimentally induced intrinsic or extrinsic motivation and the assessment of the consequences of motivation on several variables has shown that intrinsic motivation leads to more positive consequences than extrinsic motivation. Three series of studies experimentally induced intrinsic or extrinsic motivation in participants and then assessed the consequences on different variables. The first series of studies showed that creating a condition of intrinsic motivation resulted in greater levels of creativity than creating a condition of extrinsic motivation (Amabile, 1985; Hennessey, 1989, as cited in Vallerand, 1997). The second series showed that inducing intrinsic motivation to learn resulted in higher levels of learning of several different subjects (Lepper & Cordova, 1991; Parker & Lepper, 1992). The third series demonstrated that experimental programs that induce either intrinsic or identified regulation to stop smoking lead to greater abstinence that extrinsically motivated incentives (Curry, Wagner, & Grothaus, 1991; Harackiewicz, Sansone, Blair, Epstein, & Manderlink, 1987).

Limitation of Self-Determination Theory

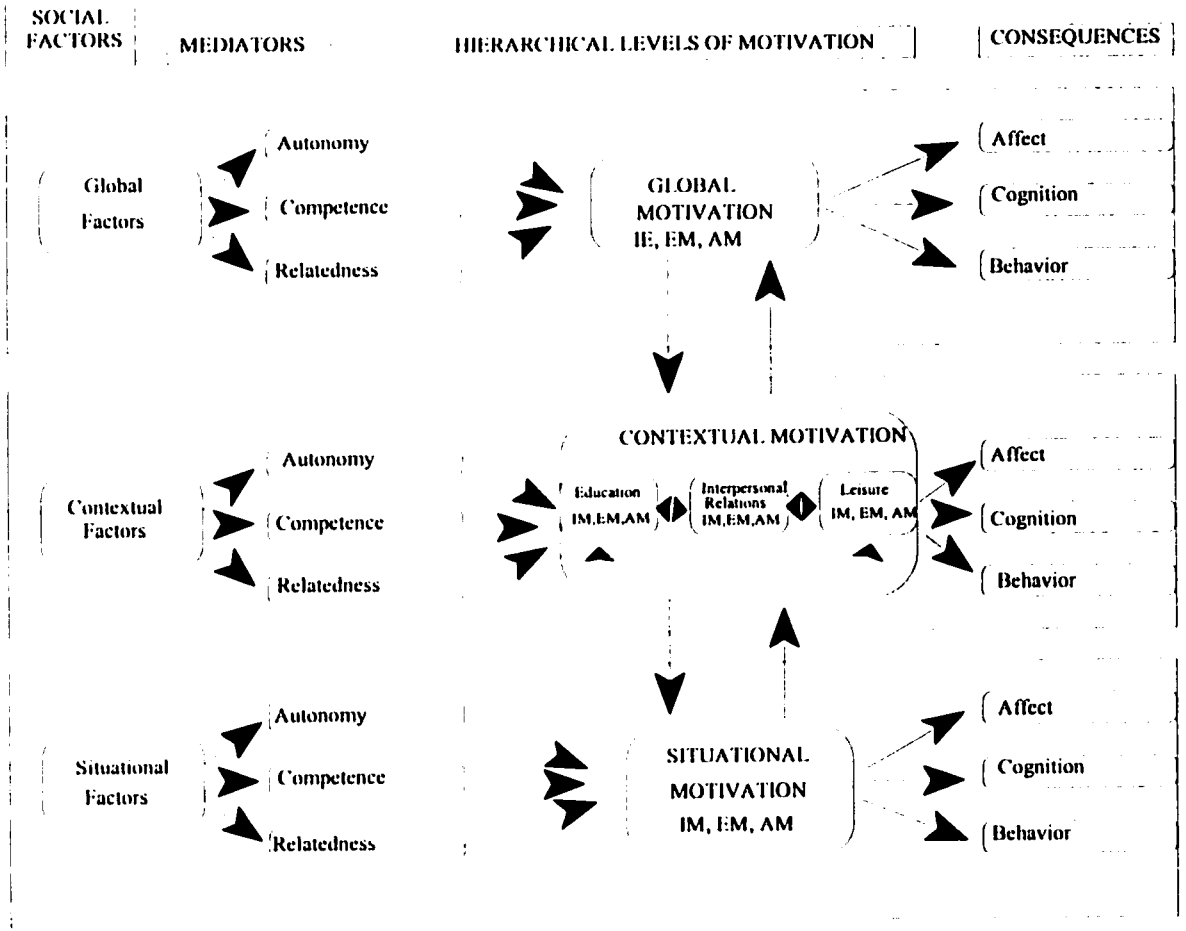
Past research using Self-Determination Theory has been conducted with domains of behaviour that are considered to be functional, or to explain motivation to stop dysfunctional behaviours. The results have shown that higher levels of self-determination in these contexts is associated with greater involvement and more persistence, leading to more positive consequences. There have been some preliminary studies applying Self-Determination Theory to gambling motivation (Chantal, Vallerand & Vallieres, 1994, 1995) and to gambling involvement (Chantal & Vallerand, 1996) however the relationship between gambling motivation, involvement and consequences was not explored. Given that Self-Determination Theory has not previously been systematically applied to potentially dysfunctional behaviours, it is unknown if tenets of this theory can be applied to problem behaviours. According to Self-Determination Theory higher levels of self-determination for an activity are should be associated with increased involvement and persistence, which is then associated with positive consequences. According to the gambling literature, increased involvement in gambling may be associated with gambling problems. Therefore there is an inconsistency between predictions of Self-Determination Theory and the gambling literature. It may be that potentially problematic behaviours engaged in for more self-determined reasons do not lead to negative consequences, despite increased involvement and persistence. On the other hand, this theory may not be appropriate for use with potentially problematic domains.

Because Self-Determination Theory has not previously been employed to explain

the relationship between potentially problematic behaviour and consequences, testing a model of gambling based on this theory could leave many questions unanswered should the results not conform to previous findings. In order to address the limitation of Deci and Ryan's (1990) Self-Determination Theory, and to attempt to answer some of the possible questions, Vallerand's (1997) Hierarchical Model of Motivation was employed in the construction of the proposed model.

Hierarchical Model of Motivation

Vallerand's (1997) hierarchical model of motivation was incorporated into the proposed model of problem gambling to verify that postulates based on the pattern of results previously found with non-problem behaviours and their consequences could be extended to problem behaviours. The hierarchical model is depicted in Figure 1. Vallerand (1997) placed the intrinsic-extrinsic motivation distinction in a hierarchy of global (or personality), life context (or domain), and situation (or state) levels. A top-down effect from motivation at the higher level in the hierarchy on motivation at the next lower level in the hierarchy was proposed by this author. More specifically, someone with a global self-determined motivational profile would be expected to display a similar motivational profile in different contexts, such as education, leisure, and interpersonal relationships. Further, individuals with a self-determined motivational profile at a contextual level should display a similar motivational profile at the situational level. This top-down effect is proposed to be domain specific. For example, situational motivation toward leisure activity should be affected by contextual motivation toward leisure activity,



IM=Intrinsic Motivation, EM=Extrinsic Motivation, AM=Amotivation

Figure 1. The Hierarchical Model of Intrinsic (IM) and Extrinsic Motivation (EM). AM: Amotivation (From Vallerand, 1995)

and not education activity.

Consequences of motivation are also proposed to be domain specific. For example, education-related outcomes should be the result of motivation toward education, not of motivation toward leisure activities (Vallerand, 1997). Consequences may be affective, cognitive, or behaviours.

Vallerand (1997) further proposed that motivation is an intrapersonal phenomenon that is influenced by social factors. Social factors exist on the three levels of the hierarchy, global, contextual, and situational. The impact of social factors on motivation is proposed to be mediated by perceptions of competence (interacting effectively with the environment), autonomy (feeling free to choose one's course of action), and relatedness (feeling connected to significant others) at each of the three levels.

The proposed top-down effect from global to contextual levels and from contextual to situational has been supported in the areas of participation in a medical program (Williams, Grow, Freedman, Ryan, & Deci, 1996) and sports (see Vallerand, 1997, for a review). Williams et al., (1996) had obese patients entering a medical program complete a global motivation measure and five to 10 weeks later, a contextual measure of participants' motivation for participating in the program. Global self-determined motivation at Time I predicted contextual self-determined motivation toward treatment at Time II. The more self-determined patients' global motivation, the more self-determined was their contextual motivation toward engaging and participating in the medical treatment.

Two other studies in the context of physical activity or sports investigating the next level of the hierarchy found that contextual motivation toward basketball in general predicted situational motivation experienced during the game. Blanchard et al. (1995, Study 1, as cited in Vallerand, 1997) assessed basketball players' contextual motivation before the first and second game of a tournament. Situational motivation was assessed immediately after each of the two games. Contextual motivation toward basketball in general, influenced situational motivation at both times. These findings were replicated in a subsequent study which followed basketball players over an entire season (Blanchard, 1995, Study 2, as cited in Vallerand, 1997).

A recursive bottom-up relationship between motivation at situational and motivation contextual level was demonstrated in this study. Perceptions of personal and collective performance as well as the outcome (win/loss) of each game were combined to form a team performance score. Path analysis was used to assess the impact of contextual motivation and team performance (situational factors) on situational motivation, as well as the recursive effects of situation motivation contextual motivation toward basketball. Situational factors and contextual motivation influenced situational motivation at game 1, and in turn influenced contextual motivation before game 2 (Blanchard et al., 1995, Study 1, as cited in Vallerand, 1997).

Chantal, Guay, and Vallerand (1995) assessed both top-down effects and domain specificity of consequences. These authors measured motivation toward two domains (education and interpersonal relationships) as well as global motivation. Educational

(cognitive strategy utilization and academic satisfaction) and relational (loneliness and quality of relationships) consequences were also assessed. A model was proposed outlining the top-down effect of global motivation to contextual (domain) specific motivation and domain specific consequences. Results (depicted in Figure 2) supported the hypotheses that more self-determined the global motivation would be associated with more self-determined contextual motivations toward education and interpersonal relationships. More self-determined motivation toward education was associated with academic satisfaction, and more self-determined motivation toward interpersonal relationships with good relationships and less loneliness. Motivation toward education was a better predictor of educational consequences than either global motivation or motivation for interpersonal relations. Motivation toward interpersonal relationships was a better predictor of relational consequences than global or educational motivation. These findings support both the top-down effects of motivation and the domain specificity of consequences.

Vallerand's (1997) hierarchical model of motivation was incorporated into the current research following the procedure of Chantal et al. (1995). Top-down paths of global self-determination to contextual self-determination and consequences for gambling and leisure were included in the model. The inclusion of a measure of global self-determination and measures of self-determination for gambling and leisure in one study attempted verification of the formerly demonstrated postulate that higher self-determination in general leads to higher contextual self-determination in functional

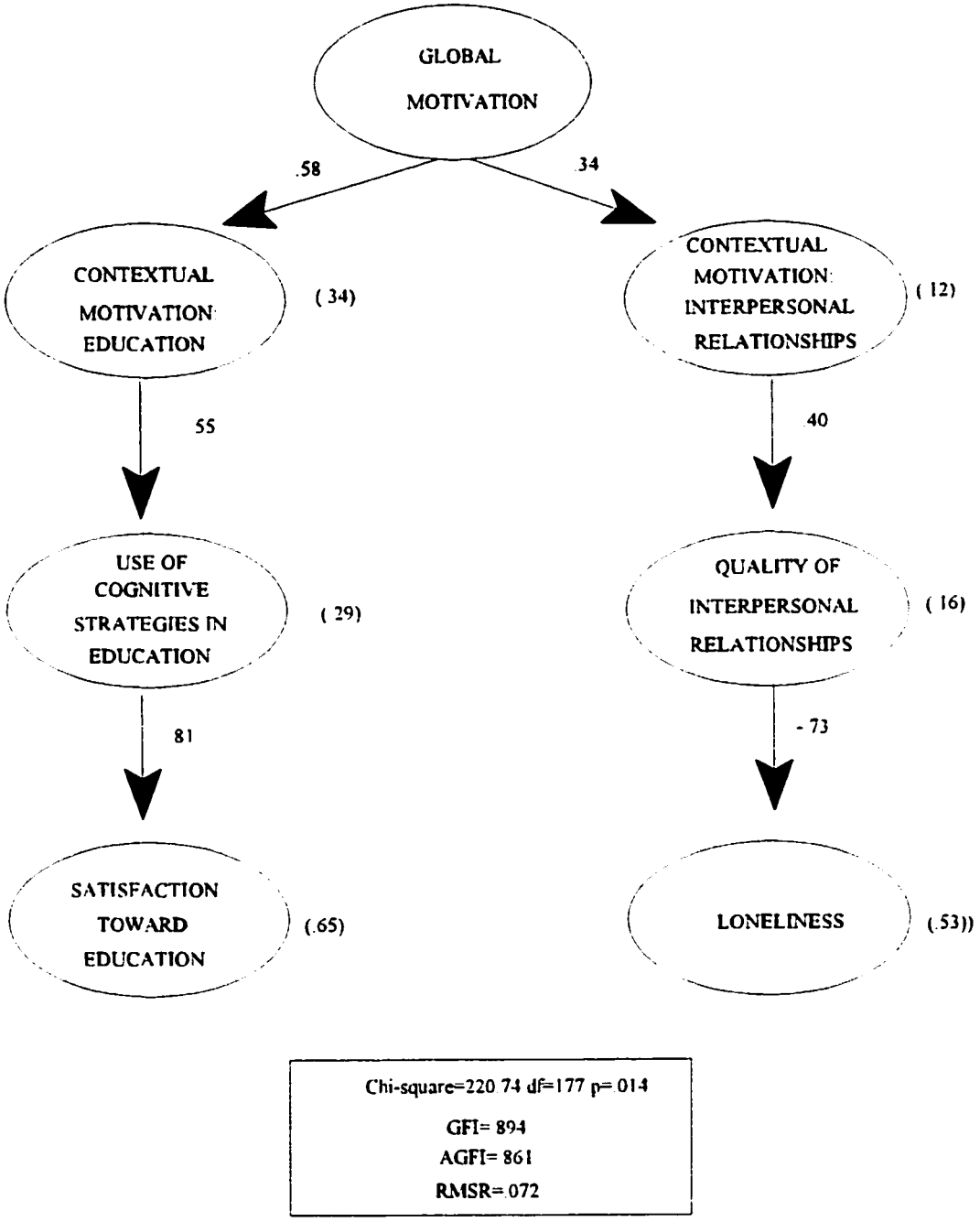


Figure 2. A confirmatory test (with LISREL) of the specificity hypothesis of motivational consequences at the contextual level. Numbers on the arrows are the fully standardized betas from the LISREL analyses (all values are significant), while those in parentheses reflect the explained variance. Please note that the measure ment model is not presented for sake of clarity. GFI: Goodness of Fit Index; AGFI: Adjusted Goodness of Fit Index; RMSR: Root Mean Square Residual. (from Chantal, Guay, & Vallerand, 1996)

behaviour. The purpose of verification was to provide evidence that this postulate can be applied to a potentially problematic behaviour therefore supporting the validity of using Self-Determination Theory to explain motivation for potentially problematic behaviours. The inclusion of domain specific consequences for both behaviours allowed confirmation of Vallerand's (1997) proposal that consequences are domain specific and tested the validity of extending the postulates of Deci and Ryan's (1990) Self-Determination Theory that higher self-determination for an activity leads to more positive consequences, and the reverse for low self-determination, to a potentially problematic behaviour. The inclusion of a previously tested domain, that of leisure, allowed comparison of results in a gambling population with past results, thus providing a test of sample specificity.

Self-Determination Theory and Gambling

The startling figures on the popularity of gambling prompted Chantal et al. (1994) to question the reasons or motivations that prompt people to be so invested, with such intense interest, in gambling. These authors pointed out that previous studies on this topic have been purely descriptive, without providing a theoretical model with which to integrate the information. Accordingly, they set out to shed light on why gamblers choose, and then persist in an activity that is so rarely profitable, through a motivational analysis based on Self-Determination Theory (Deci & Ryan, 1990).

The first step of their task was to construct and validate a motivational scale adapted to gambling behaviour. Following the tenets of Self-Determination Theory (Deci & Ryan, 1990), Chantal et al. (1994) developed a French gambling motivation

questionnaire (Échele de motivation aux jeux de hasard et d'argent (ÉMJHA)) with seven sub-scales corresponding to the motivational constructs of: intrinsic motivation to acquire knowledge, intrinsic motivation for accomplishment, intrinsic motivation for stimulation, identified regulation, introjected regulation, external regulation, and amotivation. Gambling for the pleasure of learning something new about the game, to feel in control, or for stimulation was categorized as intrinsic regulation. Gambling to relax was considered to be motivated by identified regulation. Gambling because winning makes one feel like a "big shot" would be an example of a gambler motivated by introjected reasons. Gambling for the chance of winning money was categorized external regulation. Gambling and wondering why, or whether it was good for oneself was operationalized as gambling for amotivated reasons.

A preliminary scale was administered to 20 participants, and subsequently refined. The resulting scale was administered to 346 men and 117 women recruited at the horse racetrack in Montreal. An additional four-item questionnaire was added assessing respondents' causal attributions of winning (luck or ability), estimated chances of winning, intention to gamble in the future, and compulsion to gamble. The first three items were considered positive consequences of gambling, whereas the last was considered a negative consequence. It is somewhat surprising that attributions and predictions of chances and behaviour were categorized as consequences.

Factor analyses confirmed the seven-factor structure of the scale. Loadings on the motivation for knowledge, stimulation, introjected, external, and amotivated factors all

exceeded .48. One item on the identified scale loaded at .29. Two items on the motivation for accomplishment factor had two loadings less than .30, and cross loaded with the motivation for knowledge factor. Six of the factors had eigenvalues higher than 1.00. The eigenvalue for the seventh factor, the motivation for accomplishment, approached 1 (0.91). Together the seven factors explained 63.2% of the variance.

A simplex structure of correlations between sub-scales was found, although it was not as clearly defined as some patterns previously evidenced with functional behaviours. The simplex pattern is observed when higher correlations between the sub-scales occupying adjacent positions on the continuum and lower correlations between sub-scales at the extremities are found. Decreasing correlations between sub-scales further from one another corroborates the continuum of self-determination hypothesis. In Chantal et al.'s (1994) simplex pattern of the EMJHA, identified regulation (gambling to relax) was more highly correlated with amotivation for gambling than with external regulation (gambling for money) which is the adjacent sub-scale and the external regulation sub-scale was more highly correlated with intrinsic motivation than the closer identified sub-scale. In addition, previous patterns have often demonstrated negative correlations between sub-scales furthest from each other. No negative correlations were found for the gambling sub-scales.

Scores obtained on the seven sub-scales of the ÉMJHA were correlated with the four consequences of gambling questions. The intrinsic motivation and identified regulation sub-scales were more strongly correlated with positive items, whereas less self-

determined motivations of introjection, external regulation, and amotivation were more highly correlated with the negative compulsion item. It should be noted that introjected and external regulation were significantly correlated with the positive item of estimated chances and the motivation for accomplishment, motivation for stimulation, and identified regulation scales were significantly correlated with the negative item of compulsion.

A test-retest study was conducted using 25 women and 16 men recruited at their place of employment and tested with a one-month interval. Most of these participants listed lotteries as their favourite form of gambling. Test-retest correlations confirmed the temporal stability of the ÉMJHA.

Chantal et al. (1994) considered these results encouraging but cautioned the reader that the results were preliminary. They suggested that more advanced confirmatory statistical analysis (such as LISREL) would strengthen the validity of the instrument. In addition, translation of the ÉMJHA into English would allow confirmation of these results in the United States, England and Australia, where much of the previous research on gambling has been conducted. In addition, this study was conducted with only one type of gambling activity. Horseracing in general allows for much more expertise (i.e., learning to handicap) than does other forms of gambling such as slot-machines, which are strictly games of chance. These authors suggested that this characteristic may have been reflected in the cross-loadings of the accomplishment and knowledge sub-scales. Future studies might benefit from recruitment of a variety of gambling venues.

The foregoing study contributes to our knowledge of the motivations people

endorse for gambling. An interesting aspect of this study was the authors' categorization of motivation for stimulation as intrinsic motivation. Although it is true that gambling for the stimulation might be considered to be gambling for the pure pleasure, gambling for excitement might also be considered an instrumental means of escaping the real world. Previous research has identified gambling for the thrill as a motivation endorsed by individuals with problem gambling. In addition, the categorization of causal attribution of winning to ability and estimated chances of winning as positive consequences of gambling is debatable. These variables might also be considered antecedents to problem gambling. There is some evidence that attribution of wins to ability and losses to luck, and the conviction that losses are temporary and persistence will pay off, are core beliefs of the problem gambler (Dickerson, Walker, Legg-England, & Hinchy, 1990; Walker, 1992). Consequently, there may be a confound with these particular variables. Categorization of these variables as positive consequences in the domain of gambling may be inappropriate, and interpretation of their association misleading.

Based on the findings of the foregoing study, Chantal et al. (1995) proposed that because high self-determined types of motivation predicted what were considered to be positive consequences, individuals characterized by high self-determination for gambling (having a self-determined motivational profile) would also report higher levels of gambling involvement than would individuals characterized by low self-determined profile. Their rationale was that positive feelings of efficacy, curiosity, interest and enjoyment experienced by people exhibiting a high self-determined motivational profile

(SDMP) would lead to the investment of increasing amounts of time and money in gambling activities. Alternatively, low-SDMP gamblers looking for external rewards such as money and social approval that were beyond their personal control would be expected to experience tension, obligation and uncertainly, which would make them less likely to invest time and money in the activity. The proposals offered by Chantal et al. (1995) touch on an interesting question concerning self-determination and problem gambling. Would high-SDMP gamblers or low-SDMP gamblers be expected to be more likely to have problems regulating their gambling? If Chantal et al. (1995) are correct, low-SDMP gamblers would be less likely to gamble. Therefore, it would seem that they would also be less likely to develop problems regulating their gambling and suffer negative consequences. However, less self-determined motivations have previously been associated with more negative consequences than high self-determined motivations. On the other hand, if high-SDMP gamblers are inclined to invest more time and money gambling, they would have more opportunity to fail to regulate gambling and experience negative consequences. Yet more self-determined motivations have been frequently associated with more positive consequences.

Following their own suggestion, Chantal et al. (1995) translated the French language gambling motivation scale into English. Again participants were recruited at a racetrack. One hundred and eighty-six men and 59 women completed the Gambling Motivation Scale (GAMS, the English version of the ÉMJHA) and a measure of gambling involvement that assessed number of years of gambling, weekly visits to the racecourse,

weekly gambling expenses, self perception as occasional gambler/heavy gambler, and intent to continue gambling. A Gambling Self-Determination Index was created and the median score was used as a cutoff to classify participants in terms of their SDMP. The results of this study confirmed the authors' hypotheses in that high SDMP gamblers reported a higher degree of gambling involvement than did the low-SDMP participants. However, no measure of problem gambling was included.

Chantal et al. (1995) cautioned that their results might be applicable only to French Canadians, and noted the nature of horserace gambling. The fact that successful wagering on this gambling form depends on skill and knowledge may have made the involvement variable more salient than in gambling activities that entail luck rather than skill.

In order to investigate the skill versus luck distinction, Chantal and Vallerand (1996) recruited 30 men and 30 women who favoured lotteries and 29 women and 31 men who favoured horse race gambling. Respondents completed the French version of the Gambling Motivation Scale, and a measure of involvement based on the number of years they had been involved in the game and the weekly amount of money they bet on the game.

These authors hypothesized that gambling motivation would predict involvement, and that higher levels of self-determined types of motivation would be associated with the more skilful horse race gambling. Conversely, higher levels of non self-determined types of motivation would be associated with the luck dependent lotteries. A hierarchical

discriminant function analysis resulted in one significant function suggesting that motivational predictors and level of involvement allowed significant classification between gamblers involved in horserace gambling versus those involved in lotteries. Identified regulation, external regulation, motivation for knowledge, motivation for accomplishment and motivation to experience stimulation, years of experience and weekly bets formed one common factor, with external regulation having the only negative sign. Horserace gamblers exhibited higher means on self-determined motivation and lottery gamblers reported higher levels of external regulation.

Chantal and Vallerand (1996) suggested that gamblers who are self-determined in their gambling motivation may prefer games with features that provide opportunities to exert their skill. Conversely, non-self-determined gamblers whose betting is externally regulated may be more attracted to games centred on a salient external factor such as luck. However, these authors pointed out that a third component, such as confidence or intelligence, may influence the selection of gambling type. In addition, it is possible that type of gambling selected may have been the result of exposure, and the answers on the motivation scale may have reflected justification of the chosen form of gambling.

Limitation of Self-Determination Theory and Gambling Studies

The studies on self-determination and gambling activity have begun to answer some questions about why people begin, and then persist, to wager money. Chantal et al. (1994, 1995) have suggested that self-determined gambling motivation stems from the fundamental psychological needs of autonomy and competence and the seeking of optimal

challenges. Non self-determined types of motivation for gambling are involved when one gambles to obtain a reward or to avoid pressure. Amotivated gambling represents gambling without perceived contingencies between wagering and outcome, and impairment in the sense of choice and control over betting habits. Chantal et al. (1994) proposed that this style of regulation may exemplify compulsive gambling.

The results of these studies support the validity of the concepts of intrinsic and extrinsic motivation and amotivation in gambling to a degree. Based on prior studies on Self-Determination Theory in a variety of life domains, the authors predicted that higher levels of self-determination should be associated with higher levels of involvement in the activity. Although, the authors obtained support for this proposition, these results raised an intriguing question about the relationships between levels of self-determination for gambling behaviours, involvement in the activity, and possible positive or negative consequences associated with gambling behaviours. In most life domains it has been found that higher levels of self-determination (and involvement) were associated with positive consequences (such as well being and life satisfaction; Blais et al., 1990; Ryan & Connell, 1989; Vallerand et al., 1989). However, in the case of gambling behaviours, it would appear that higher levels of involvement in gambling activities could be associated with different psychological consequences. More specifically, as individuals become more involved in gambling activities, they may be more at risk for experiencing problems with these behaviours, which should lead to experiencing more negative consequences. So far, all the studies on Self-Determination Theory and gambling behaviours have focussed on

possible determinants of motivation for gambling and the level of involvement in these activities. They have not examined the possibility that higher levels of involvement may be associated with problem gambling and with negative consequences.

Self-Determination, Gambling Involvement, and Consequences

The inclusion of a measure of involvement in the current study furthers the research of Chantal et al. (1995) by investigating the relationship between self-determination, involvement and consequences of gambling. The finding by Chantal et al. (1995) that high self-determined motivational profile (SDMP) gamblers reported higher levels of gambling involvement than did low-SDMP gamblers, raised the intriguing question of whether this involvement would be associated with positive consequences, as the Theory of Self-Determination would predict, or negative consequences as a result of increased opportunity for failure of control over the activity. It may be that the intense interest and involvement characterized by self-determined behaviour is adaptive in activities that have predominantly positive consequences. Disengaging from such activities is viewed as a less favourable outcome than persistence. For some activities, such as gambling, both positive and negative consequences can be in attendance. In the absence of negative consequences, engaging in the behaviour for the sheer pleasure of doing so is viewed as entertainment. When negative consequences overrule the positive ones, engaging in the behaviour for the sheer pleasure of doing so is deemed to be problem behaviour and persistence is considered maladaptive.

Research on gambling suggests that higher level of involvement may be, but is not

necessarily, associated with higher level of problem gambling and impaired self-control. In a large-scale survey of gambling in Ontario, Ferris, Stirpe, and Ialomiteanu, (1996) found that total gambling activity was related to three separate measures of problem gambling (life areas, the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987), and DSM-IV), with more involvement (frequency/spending) correlating with more problems. On the other hand, in a comparison of low and high-frequency gamblers, and problem gamblers who had sought treatment, Corless and Dickerson (1989), found that level of involvement accounted for a large part of the variability in a measure of self-control in gambling, but that a significant portion of variability remained unaccounted for. These authors concluded that greater impairment of control was perceived by problem gamblers partially as a function of their gambling more frequently, but also because of other factors not assessed in the study. In sum, inclusion of a measure of involvement in the current study allowed us to investigate the intriguing relationship between forms of regulation for a potentially problematic activity, involvement in the activity, and consequences. Involvement in this research was measured by frequency of participating in a variety of gambling activities.

Negative consequences of gambling were represented by scores on the South Oaks Gambling Screen. The SOGS has seven dimensions: family disruption, job or school disruption, lying about gambling, default on debts, going to someone to relieve a desperate financial situation that has resulted from gambling activity, borrowing from illegal sources to finance gambling and committing an illegal act to finance gambling. Previous research

has found that more self-determined reasons for involvement in an activity have been associated with greater psychological health. In the absence of a global measure of psychological health, an index was created using different constructs. Following the procedure of Pelletier, Vallerand, Green-Demers, Briere, and Blais (1995) measures of self-esteem, satisfaction with life, and depression were combined to form a second-order factor of psychological functioning.

The proposed model examined the relationship between types of motivation and both positive and negative consequences. For the purpose of clarity, types of motivation for specific domains were grouped according to an autonomous versus controlled regulation, allowing direct associations to be proposed between high self-determination (autonomous regulation) and positive consequences, and low self-determination (controlled regulation) and negative consequences. Intrinsic motivation and identified regulation were combined to form high self-determined orientation constructs. Introjected and external regulation, and amotivation comprised low self-determined orientation constructs (Elliot & Sheldon, 1998; Pelletier, in press; Sheldon & Elliot, 1998). This grouping also served purposes of parsimony recommended for structural equation modelling procedures.

Summary and Proposed Model

The inclusion of a measure of global self-determination and measures of contextual self-determination of leisure and gambling in one study should allow verification of the postulate that higher self-determination in general leads to higher contextual self-

determination. In addition it should extend this postulate from a functional activity to a potentially problematic activity. Inclusion of positive and negative consequences specific to each domain and measures of psychological functioning should test the validity of extending the postulates of Deci and Ryan's (1990) Self-Determination Theory that higher self-determination for an activity leads to more positive consequences, and the reverse for low self-determination, to potentially problematic behaviours such as gambling. In addition the inclusion of a previously tested domain, related to but separate from gambling, should eliminate the possibility that findings were sample specific.

The proposed model should allow us to:

1) determine whether associations between forms of motivation for gambling and its consequences are consistent with predictions from Self-Determination Theory, by comparing them to the relationships between motivation for leisure and consequences in the same participants

2) examine the relationship between motivation for gambling and its consequences

3) test Vallerand's postulate that relationships between a motivation for one domain and consequences related to that domain are significant only for that domain.

The proposed model is shown in Figure 3. It was proposed that global motivational orientation would be channelled toward the domains of leisure activities and gambling. Global self-determination was expected to be positively associated with self-determined forms of leisure activities. Based on prior research it was further proposed that self-determined forms of regulation for leisure would be positively associated with

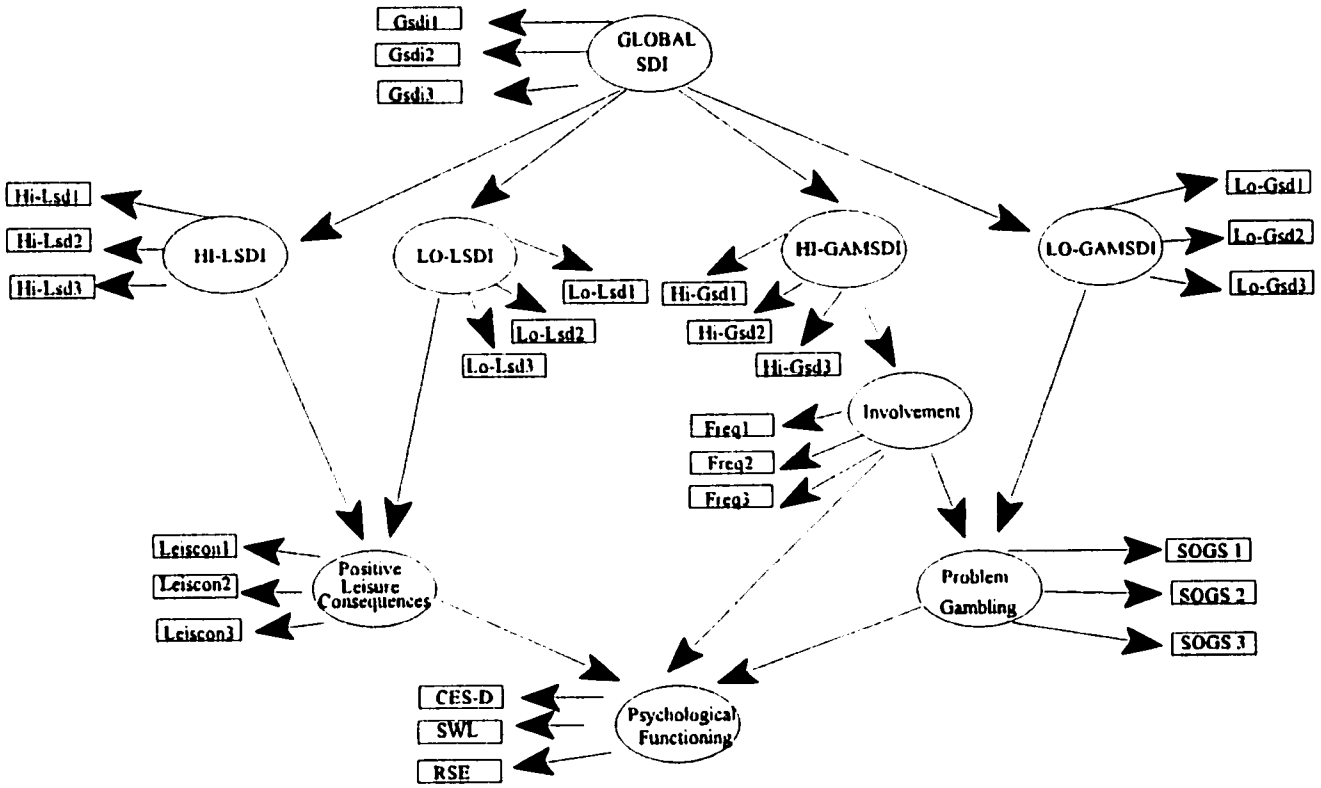


Figure 3. A Hierarchical Model of Motivation for Leisure and Gambling Activities
Note: GSDI=Global Self-determination Index; LO-LSDI=Low Leisure Self-determination Index; HI-LSDI=High Leisure Self-determination Index; LO-GAMSDI=Low Gambling Self-determination Index; HI-GAMSDI=High Gambling Self-determination Index

positive leisure consequences. A negative relationship was expected for non-self-determined forms of regulation for leisure and positive leisure consequences. Positive leisure consequences would be positively related to the psychological functioning construct, indicating higher self-esteem and satisfaction with life, and lower depressive symptomatology.

It was expected that a more self-determined global motivational profile would be positively related to self-determined forms of regulation for gambling. According to Deci and Ryan's (1990) Self-Determination Theory, it was expected that low self-determined forms of regulation for gambling would be positively associated with problem gambling. Self-determined forms of regulation for gambling were expected to be positively associated with a high level of involvement, which would be positively related to the psychological functioning construct. Based on gambling research, involvement was also expected to be positively associated with problem gambling. Problem gambling would be negatively associated with the psychological functioning construct.

Prior to testing this model, a preliminary study was conducted to evaluate the proposed measures and to examine the relationship between self-determination for gambling and its consequences. This pilot study is the first to examine the relationship between self-determination and a potentially problematic behaviour and its consequences.

PILOT STUDY

The purpose of the pilot study was to evaluate the proposed measures and explore the relationships between gambling motivation and gambling consequences. Although some research applying Self-Determination Theory to gambling behaviour has been conducted, it did not examine how different forms of motivation and involvement in gambling were related to problem gambling and psychological functioning. Because this research embarks on new territory a preliminary exploration of the relationships between motivation for gambling, gambling involvement, gambling problems, and psychological functioning was conducted. In addition, the results of factor analysis and the pattern of correlations between sub-scales of the English version (the Gambling Motivation Scale, GAMS) of the Échelle de motivation aux jeux de hasard et d'argent (ÉMJHA) were not reported by Chantal et al., 1994). Because the predictions of the proposed research rely on the validity of the GAMS and the continuum of self-determination proposed by Deci and Ryan (1990), the structural validity of the scale and pattern of correlations between sub-scales were assessed. A modified version of The South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987), and a measure of gambling involvement were also evaluated. The pattern of correlations between the sub-scales of the GAMS and the SOGS, gambling involvement, and measures of psychological functioning were also examined. Finally, recruitment procedures were evaluated by testing for homogeneity of the sample.

Method

Procedure

In an effort to ensure that the sample represented problem and non-problem gamblers, and to increase the percentage of problem gamblers beyond the population figure in order to have sufficient number of problem gamblers for comparison, recruitment was conducted in several different contexts: university classes, Gambler Anonymous meetings, problem gambling treatment centres, and individuals known by the experimenter to gamble. Participants received a questionnaire package that contained: (a) a cover letter explaining the purpose of the study and instructions for completing the questionnaire (b) a leisure activity screen (c) a measure of gambling motivation (d) a problem gambling screen (e) measures of psychological functioning (g) a demographic questionnaire (see Appendix A). The cover letter informed respondents that the purpose of the study was to investigate the relationship between people's perceptions of themselves and their reasons for engaging in gambling activities. It was explained that participation involved filling out the package of questionnaires. In addition, this letter explained that participation was voluntary and requested that respondents not put their names on the questionnaire so that the answers would be anonymous. Respondents were encouraged not to leave any items unanswered, but to pick the response that best described their thoughts and feelings for the item. Telephone numbers of the investigators were provided with an invitation to telephone with questions and concerns, as well as the telephone number of the Ontario Problem Gambling Hotline.

Professors were asked permission to distribute questionnaires at the beginning of their class. Students were informed that the purpose of the study was to investigate the relationship between people's perceptions of themselves, their lives, and their reasons for engaging in gambling activities. They were informed that participation in the study was entirely voluntary, and that should they choose to participate, their answers would be anonymous and confidential. They were asked to try to provide answers to all the questions, but told that they were free to not answer questions they found objectionable. Students were asked to take the questionnaire home to complete, and return it the following class when it would be collected by the experimenter.

Three open Gambler's Anonymous (GA) meetings were attended by the investigator. The chairperson of the meeting informed the members of the experimenter's presence at the beginning of the meeting. No objections were registered. Prior to the coffee break, the experimenter was invited by the chairperson to introduce the study to the members. A similar procedure as with students was followed, except that members were provided with postage-paid, return-addressed envelopes.

Individuals who were known by the experimenter to gamble were given questionnaires and addressed postage-paid envelopes. They were asked to complete the questionnaire themselves and to ask people that they knew who gambled to do the same.

With the permission of the Directors of the Addictions Centre and the Donwood Problem Gambling Centre, a letter describing the study and requesting co-operation was sent to each therapist along with a supply of brochures describing the study and requesting

participation (see Appendix A). Therapists were asked to give a brochure to each of their clients who came for counselling for problem gambling. The brochure advised readers that a questionnaire package was available from the receptionist. A similar letter and a supply of questionnaires in stamped, addressed envelopes were sent to the receptionist at each centre.

Participants

Respondents were students of the University of Ottawa and Carleton University, members of the general public, members of Gamblers Anonymous (GA), and clients of the Addictions Centre and the Donwood Problem Gambling Centre. A total of two hundred and forty-nine respondents participated in the study. Twelve respondents (21%) failed to complete all the questions required for the analysis and were excluded. The sample (N=237) was comprised of 84 men and 150 women; three participants did not indicate their gender. Ages ranged from 19 to 83 (M=33), and reported income (27 participants did not provide this information) ranged from $0 to $250,000 (M=$31,500). Eighty-eight participants were employed, 72 were students, 59 were employed students, 12 were retired, 1 was a homemaker, 3 were homemakers and employed, 2 were unemployed.

Measures

Gambling Motivation Scale, (GAMS; Chantal et al., 1995). The GAMS is a 28-item Likert type questionnaire. Items represent potential answers to the question: "Why do you gamble?" (examples are presented in Table 2). These items are scored on a 7-point Likert-type scale anchored by the endpoints *does not correspond at all* (1) and

corresponds exactly (7). The GAMS comprises seven sub-scales that correspond to the seven types of motivation: intrinsic motivation to know (GAMKN), to accomplish things (GAMAC),

Table 2

Examples of Items for Each Sub-scale of the Gambling Motivation Scale

Sub-scale	Example (Why do you gamble at your favourite game?)
Intrinsic Motivation for Knowledge	For the pleasure I get when I improve my knowledge of the game.
Intrinsic Motivation for Accomplishment	For the satisfaction I get when I can control the game.
Intrinsic Motivation for Stimulation	Because of the enormous rush I get.
Identified Regulation	Because it is the best way for me to relax completely.
Introjected Regulation	Because it makes me feel important.
External Regulation	I gamble to become rich.
Amotivation	I gamble, but sometimes I wonder what it does for me.

and to experience stimulation (GAMST), extrinsic motivation by identified regulation (GAMID), introjected regulation (GAMINT), external regulation (GAMEXT), and amotivation (GAMAM). Internal consistency values of the seven sub-scales have been reported as: .81 for Intrinsic Motivation to Know, .78 for Intrinsic Motivation to

Accomplish, .73 for Intrinsic Motivation to Experience Stimulation, .64 for Identified Regulation, .80 for Introjected Regulation, .77 for External Regulation, and .78 for Amotivation. Correlations between the three intrinsic sub-scales were all greater than .71. It was decided, for the sake of parsimony, to combine them into one Intrinsic Motivation (GAMIN) sub-scale. Because we had no specific hypotheses regarding the different types of intrinsic motivation, the stimulation, accomplishment and knowledge intrinsic sub-scales were summed and divided by three. In the current study Cronbach Alphas ranged from .84 to .93.

The factorial structure of the ÉMJHA (the French version of the GAMS) has been demonstrated by Chantal et al., (1994). The existence of a simplex pattern of correlations between the sub-scales that partially supports the hypothesis of a continuum of self-determination has also been shown (Chantal et al., 1994). This same pattern was found with variables pertinent to gambling, providing some evidence of construct validity (Chantal et al., 1994).

South Oaks Leisure Activity Screen, (SOLAS; Lesieur & Blume, 1993). The SOLAS was developed to be administered to partners, friends and family members of gamblers to acquire additional information and form verification of gamblers' responses on the South Oaks Gambling Screen (SOGS). The purpose of the screen in this research was to obtain the respondent's assessment of his/her level of interest in 11 different types of gambling, from *no interest at all* (1) to *obsessive interest* (4). Four groups were formed: no interest, moderate interest, heavy interest, and obsessive interest. Respondents who

indicated they had obsessive interest in at least one form of gambling formed the obsessive interest group. Those who at most had heavy interest in some form of gambling formed the heavy interest group. Respondents who had no more than moderate interest in any form of gambling were included in the moderate group. Those who selected "no interest" for all forms of gambling listed made up the no interest group.

The South Oaks Gambling Screen, (SOGS; Lesieur & Blume, 1987). The SOGS is the most widely used screen for gambling problems. This screen is a 16-item self-report questionnaire based on a modification of the DSM-III diagnostic criteria for pathological gambling. The SOGS has seven dimensions: family disruption, job or school disruption, lying about gambling, default on debts, going to someone to relieve a desperate financial situation that has resulted from gambling activity, borrowing from illegal sources to finance gambling and committing an illegal act to finance gambling. A score of 5 indicates pathological gambling, and scores of 3 or 4 have been used to classify individuals as problem gamblers. It has been found to be highly correlated with assessments based on the DSM-III-R criteria (r=.94) indicating good validity. Internal consistency is high (Cronbach's alpha=.97). Test-retest correlation (using a dichotomous classification of pathological or nonpathological) was 1.0 for outpatients. The SOGS has been found to be highly correlated with the DSM-III-R. For the purposes of the type of analyses performed in this study, the SOGS's dichotomous response selections were changed to a 5-point Likert scale from 1=Never to 5=Very Frequently to increase variation in the scores.

Gambling Involvement (Involve). Gambling Involvement is a sub-scale of the SOGS. It was calculated by summing respondents' answers to question 1 of the SOGS (SOGS; Lesieur & Blume, 1987) concerning frequency of gambling. The gambling involvement sub-scale does not represent assessment of problem gambling, and is not included in the scoring of problem gambling. Respondents are asked to indicate which of 12 types of gambling listed they have done in the last year (play cards for money, bet on horses, etc.). Choices are: 1=not at all, 2=less than once a week, 3=once a week or more. For purposes of statistical analysis these answers were recoded so that selection of "not at all" was assigned a 0, "less than once a week" a 1, and "once a week or more" a 2. These 12 items were then summed to form a measure of frequency of gambling activity.

Psychological Functioning (PF). Psychological functioning was assessed by measures of self-esteem and depression. Self-esteem was measured by the Rosenberg Self-esteem Scale (RSE; Rosenberg, 1979). The RSE consists of 10 items. Internal consistencies of Cronbach alpha .77 and .88 have been obtained in previous research. Cronbach alpha was .89 in this study. Test retest correlations range from .82 to .85. It has been found to correlate with the Self-description Inventory (r=.64) (Kahle, 1976). Depressive symptoms were measured with the Self-Rating Depression Scale (SDS; Zung, 1965). The SDS is a 20-item instrument developed to examine three basic aspects of depression: (1) pervasive affect, (2) physiological concomitants, and (3) psychological concomitants. The SDS consists of 10 items worded symptomatically positive and 10 items symptomatically negative. Respondents rate on a 4-point sliding scale each of the

20 items as to how it applies to them at the time of testing. The SDS is scored by summing the values obtained on each item to produce a raw score ranging from 20 to 80. The SDS has fair internal consistency, with a split-half reliability of .73. It has been reported to correlate with the Beck Depression Inventory (BDI; Beck, 1961) (Robinson, Shaver & Wrightsman, 1991). In the current study it had an internal consistency value (Cronbach's alpha) of .84.

Statistical Analyses

Data analysis consists of (a) preliminary analyses, (b) descriptive analyses, and (c) confirmatory factor analysis. Preliminary analyses were screening procedures to ensure factor analysis assumptions were met. Descriptive analyses provided summary statistics, correlations, and group differences.

Prior to analysis variables were examined through various SPSS programs for missing values, normality, linearity, and the presence of outliers. Skewness and kurtosis were evaluated using a criterion of z score 3.67 above or below zero (p=.001). Cases with standardized scores in excess of plus or minus 3.67 were considered to be univariate outliers. Multivariate outliers were identified according to Mahalanobis distance criterion of p<.001. Correlation matrices were inspected for evidence of multicollinearity and singularity.

Confirmatory factor analyses (CFA) procedure was used to test the validity of the GAMS. Model assessment was based on (a) the parameter estimates, (b) the measurement model, and (c) the model as a whole. Indices of fit provided by LISREL (the chi-square

likelihood ratio statistic, the Comparative Fit Index (CFI) (Bentler, 1990), the Root Mean Square Error of Approximation (RMSEA) (Steiger & Lind, 1980), the Parsimony Comparative Fit Index (PCFI) (Mulaik et al., 1989) and the logic of the underlying theory were used to evaluate the model as a whole. The χ^2 tests the closeness of fit between the sample covariance matrix and the population covariance matrix implied by the model. The probability value associated with χ^2 represents the likelihood of obtaining a χ^2 value that exceeds the χ^2 when the hypothesis that the model fits perfectly in the population is true. Thus the higher the probability associated with χ^2, the closer the fit between the hypothesized model and the perfect fit. The chi-square tends to be oversensitive and the null hypothesis is generally rejected (Bentler & Bonnett, 1980), and given the dependence of the χ^2 statistic on sample size, the χ^2 value is more appropriate used as a measure of fit than a test statistic (Byrne, 1998, p.111). Therefore additional goodness of fit statistics (their description follows) and the substantive validity of parameter estimates were used as model-testing criteria.

The CFI is an incremental index of fit based on a comparison of the hypothesized model against the independence model. The independence model is a model of complete independence of all variables (all correlations among variables are zero). The CFI takes sample size into account in order to avoid underestimation of fit in small samples. Its values range from zero to 1.00. It provides a measure of complete covariation in the data, with a value >.90 indicating an acceptable fit to the data (Bentler, 1992).

The PCFI adjusts the CFI to take the complexity of the model into account. The

PCFI is calculated by multiplying the CFI by the degrees of freedom of the proposed model divided by the degrees of freedom of the independence model. It weighs the parsimony of the model against post-hoc fitting by incorporating additional parameters. It has been suggested that indices of fit in the .90s accompanied by PCFI's in the 50's are acceptable, however, values greater than .80 are considered to be more appropriate.

The RMSEA takes into account the error of approximation in the population and indicates how well the model with unknown but optimally selected values would fit the population covariance matrix if it were available. Values of .05 indicate good errors of approximation in the population and values as high as .08 represent a reasonable fit.

Internal consistencies of the modified South Oaks Gambling Screen, the gambling involvement measure, and the psychological functioning measures were assessed using Cronbach's alpha. The existence of a simplex pattern between sub-scales of the GAMS was investigated, and a preliminary analysis of the relationship between gambling involvement, gambling motivation, and psychological functioning was performed using correlational analyses. In order to evaluate the recruitment procedure and determine whether the student respondents were similar to respondents selected through word of mouth, GA, and the Donwood, t-tests were performed on gambling involvement, problem gambling, and gambling motivation.

Results

Preliminary Analyses

Missing data

Twenty-four cases missing one to three values were identified. The randomness of omissions was tested by forming two groups based on missing and nonmissing data and testing for patterns in missing data. No differences were found on variables that were proposed to be related to the variables with missing data. The mean of the respective sub-scale was used to replace the missing values.

Normality

The summary statistics of all the variables involved in the study were examined. The means, standard deviations, kurtosis and skewness values of the variables are shown in Table 3.

The intrinsic motivation for accomplishment item, the identified motivation sub-scale and three of its individual items, the introjected motivation sub-scale and three of its items, the gambling involvement measure and the South Oaks Gambling Screen showed significant kurtosis (kurtosis = 2.92 to 18.16). The three identified items, the introjected sub-scale and the three items, the gambling involvement and the South Oaks Gambling Screen showed significant skewness as well (skewness = 2.05 to 4.21). Logarithmic transformation of the gambling involvement variable resulted in normal distribution. Inverse transformation, following exploration of logarithmic transformation, resulted in normal distributions for the intrinsic motivation for accomplishment item, all identified items and the sub-scale, one

Table 3

Summary Statistics for Variables

Variables	Mean	Standard Deviation	Kurtosis	Skewness	Range
Intrinsic Gambling Motivation (GAMIN)	1.96	1.22	1.15	1.41	1-7
GAMIN Stimulation	2.17	1.50	1.41	1.43	1-7
GAMIN Knowledge	1.48	1.26	1.48	1.44	1-7
GAMIN Accomplishment	3.18	1.26	3.18	1.93	1-7
Identified Gambling Motivation (GAMID)	1.70	1.17	3.08	1.89	1-7
GAMID1	1.70	1.40	4.71	2.28	1-7
GAMID2	1.64	1.42	5.02	2.39	1-7
GAMID3	1.98	1.73	1.74	1.71	1-7
GAMID4	1.48	1.11	7.11	2.65	1-7
Introjected Gambling Motivation (GAMINT)	1.46	.99	7.09	2.64	1-7
GAMINT1	1.48	1.16	7.24	2.76	1-7
GAMINT2	1.39	1.05	13.06	3.47	1-7
GAMINT3	1.24	.91	18.16	4.21	1-7
GAMINT4	1.84	1.59	2.92	1.97	1-7
External Gambling Motivation (GAMEXT)	2.78	1.78	- .46	.79	1-7
GAMEXT1	2.49	1.97	.05	1.15	1-7
GAMEXT2	2.43	1.92	.01	1.13	1-7
GAMEXT3	3.06	2.21	-1.08	.63	1-7
GAMEXT4	3.15	2.18	-1.06	.61	1-7
Amotivation for Gambling (GAMAM)	2.38	1.68	.25	1.15	1-7
GAMAM1	2.37	1.98	.03	1.20	1-7
GAMAM2	2.21	1.86	.63	1.39	1-7
GAMAM3	2.73	2.06	- .64	.87	1-7
GAMAM4	2.23	2.04	.44	1.41	1-7
Gambling Involvement	4.20	4.16	6.16	2.05	0-36
South Oaks Gambling Screen	15.93	9.52	5.72	2.52	11-55
RSE	33.54	5.92	.14	- .92	10-40
SDS	35.83	9.06	.44	.80	20-80

introjected motivation item, and the South Oaks Gambling screen. The kurtosis for the introjected items was reduced to 2.3 and 8.7 and skewness was reduced to -1.9 and -3.19. Because minor deviations from normality are likely to be statistically significant with a large sample size, a variable with significant skewness or kurtosis often does not deviate enough from normality to make a realistic difference in the analysis (Tabachnick & Fidell, p. 46). The skewness and kurtosis of the introjected sub-scale approached normal values (-1.7 and 2.3) and were considered to be acceptable. For the sake of consistency in the CFA, the remaining Gambling Motivation items were transformed resulting in normal distributions.

Linearity

Linearity was assessed by inspecting a random selection of bivariate plots. Distributions appeared to be linear.

Outliers

There were no univariate outliers. Eight multivariate outliers were identified. A dummy grouping variable was created and regression analysis was performed in order to discover why these cases were extreme. Inspection revealed that these respondents had scored erratically within sub-scales, scoring very high on one item and low on another. All outliers were eliminated from analyses.

Homoscedasticity

The bivariate scatterplots were also inspected to identify uneven distributions of the variance in scores on the variables. No evidence of heteroscedasticity was found.

Multicollinearity

Correlations between all possible pairs of variables included in the analyses were scanned for multicollinearity. There were no correlations in excess of .90 (Tabachnick & Fidell, 1989, p. 87).

Descriptive Statistics

Gambling Motivation

The gambling motivation most highly endorsed by this sample was extrinsic motivation by external regulation (M=2.78, SD=1.78), followed by amotivation for gambling (M=2.38; SD=1.68), intrinsic motivation (M=1.96; SD=1.22), identified regulation (M=1.70, SD=1.17), and introjected regulation (M=1.46, SD=.99). The scores spanned the full range of 1 to 7, however, considering the theoretical mean of these sub-scales is 3.50, the majority of the respondents endorsed these motivations for gambling to a less than average degree.

South Oaks Leisure Activity Screen

Twenty-five respondents (10.5 %) indicated that they had no interest in any form of gambling. One hundred and thirty-one respondents (55 %) identified themselves as moderately interested in at least one gambling activity. Fifty respondents (21 %) endorsed heavy interest, and 22 (.9 %) considered themselves to have an obsessive level of interest in at least one form of gambling.

South Oaks Gambling Screen

Scores on the modified SOGS ranged from 11 to 55 which represents the full theoretical range. The average score was 15.93 (SD=9.52) indicating that the majority of

respondents reported having few gambling problems.

Gambling Involvement

Gambling involvement scores ranged from 0 to 27. Thirty respondents (12.6 %) had scores of 0, indicating that they had not gambled at all in the last year. The majority of respondents (M=4.39; SD=4.16) either engaged in one form of gambling less than once a week, or several forms less frequently.

Psychological Functioning

Rosenberg Self-Esteem Scale scores ranged from 14 to 40. The average score was 33.54 (SD=5.93) indicating that the majority of subjects reported having a high level of self-esteem. Scores on the Zung Self-Rating Depression Scale ranged from 20 to 66. The average score was 35.83 (SD=9.06) indicating the majority of subjects reported having few symptoms of depression.

Construct Validity and Relationships Between Variables

Gambling Motivation Scale (GAMS; Chantal et al., 1994)

Specification of the model of that was tested included: (a) five factors; (b) loading on the factor it was designed to measure; (c) correlations between the five factors; and (d) uncorrelated measurement error terms for each item.

Results of CFA analysis of the initially hypothesized model revealed that all parameter estimates were reasonable and statistically significant. Examination of the R^2 values revealed that the measurement model was adequately represented by the observed measures, and was an adequate fit for the data (CFI = .93, RMSEA = .081, PCFI = .77).

In order to identify areas of misfit in the model the modification indices provided by LISREL VIII were examined. The highest modification index involved freeing a correlated error between two identified motivation for gambling items. In light of the acceptable measures of fit, and the absence of further outstanding values suggestive of model misfit, no changes were made to the initial model to avoid overfitting. The model is shown in Figure 4.

Internal consistencies of the five sub-scales were as follows: .93 for Intrinsic Motivation, .84 for Identified Regulation, .85 for Introjected Regulation, .89 for External Regulation, and .87 for Amotivation. The replication of intrinsic, identified, introjected, external motivation and amotivation factors with a diverse sample of gamblers provides support for the Gambling Motivation Scale and for its use in Study 2.

Correlations between the sub-scales of the Gambling Motivation Scale did not show a clear simplex pattern. A decreasing pattern of correlation was not shown between intrinsic, identified and introjected sub-scales. However, the extrinsic sub-scale showed the expected higher correlations between adjacent sub-scales than with sub-scales further along the continuum. The amotivation sub-scale was more highly correlated with the intrinsic, identified and introjected sub-scales than the external sub-scale, which does not conform to the simplex pattern. These correlations are shown in Table 4.

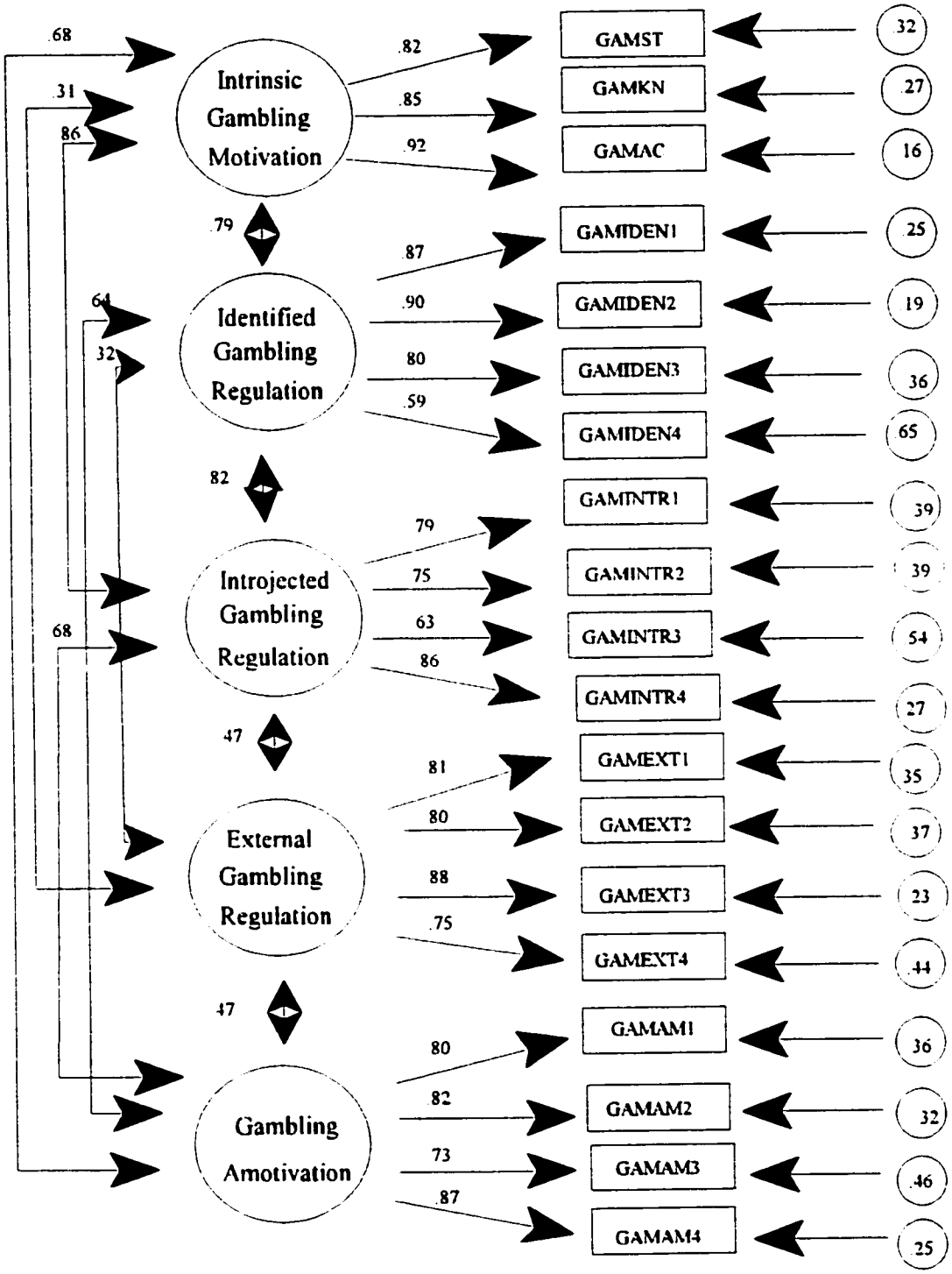


Figure 4. CFA of Gambling Motivation Scale. All parameters are significant at .01 level. Note: GAMST=Intrinsic Gambling Motivation for Stimulation; GAMKN=Intrinsic Gambling Motivation for Knowledge; GAMAC=Intrinsic Gambling Motivation for Accomplishment; GAMIDEN=Identified Gambling Regulation; GAMINTR=Introjected Gambling Regulation; GAMEXT=External Gambling Regulation; GAMAM=Gambling Amotivation

Table 4

Correlations between Gambling Motivation Sub-scales

	GAMIN	GAMID	GAMINT	GAMEXT	GAMAM
GAMIN	1.00	.73***	.73***	.26***	.57***
GAMID		1.00	.72***	.25***	.51***
GAMINT			1.00	.39***	.57***
GAMEXT				1.00	.42***
GAMAM					1.00

Note. GAMIN = Intrinsic Gambling Motivation, GAMID = Extrinsic Gambling Motivation by Identified Regulation; GAMINT = Extrinsic Gambling Motivation by Introjected Regulation; GAMEXT = Extrinsic Gambling Motivation by External Regulation; GAMAM = Gambling Amotivation;
***$p<.001$

Correlations between the sub-scales of the Gambling Motivation Scale and constructs related to gambling, gambling involvement, problem gambling, self-esteem and depression were calculated. Correlations are depicted in Table 5 with the reverse direction caused by the inverse transformation removed for clarity. As can be seen in Table 5, intrinsic motivation for gambling was most highly correlated with gambling involvement. There was little differentiation between the remaining sub-scales and their association with gambling involvement. All motivations were significantly correlated with problem gambling, but

Table 5

Correlations between Involvement, Problem Gambling, Motivation for Gambling, and Psychological Functioning Measures.

	GAMIN	GAMID	GAMINT	GAMEXT	GAMAM	INVOLVE	SOGS	RSE	SDS
INVOLVE	.48***	.35***	.36***	.33***	.35***	-			
SOGS	.67***	.65***	.66***	.38***	.74***	.43***	-		
RSE	.06	.06	-.17**	-.14*	-.15*	-.11	-.15*	-	
SDS	.14*	.16*	.27***	.16*	.19**	.16*	.24***	-.73***	-

Note. GAMIN = Intrinsic Gambling Motivation, GAMID = Extrinsic Gambling Motivation by Identified Regulation; GAMINT = Extrinsic Gambling Motivation by Introjected Regulation ; GAMEXT = Extrinsic Gambling Motivation by External Regulation; GAMAM = Gambling Amotivation; SOGS=South Oaks Gambling Screen; INVOLVE=Gambling Involvement; RSE=Rosenberg Self-Esteem Scale; SDS=Zung Self-Rating Depression Scale
*p<.05. **p<.01. ***p<.001

differentially so. Intrinsic, identified, and introjected motivations were more strongly correlated with gambling problems than the less self-determined external motivation, and amotivation was most highly correlated with this variable. Intrinsic and identified motivations for gambling were not significantly correlated with self-esteem, but the less self-determined forms of gambling regulation, introjected, external, and amotivation were negatively related to this variable. All motivations for gambling were significantly correlated with symptoms of depression.

The South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987)

Internal consistency of this scale was acceptable (Cronbach alpha = .95). Exploratory factor analysis of the modified SOGS revealed one factor with an eigenvalue of 8.0 that accounted for 70.3% of the variance. As expected, the SOGS was negatively related to the RSE and positively related to the SDS indicating that gambling problems are associated with negative psychological symptoms (see Table 5). The SOGS was also positively related to gambling involvement, suggesting that increased frequency of gambling is associated with gambling problems.

Gambling Involvement (Involve)

The internal consistency of this scale was found to be acceptable (Cronbach alpha = .71). Exploratory factor analysis resulted in one factor with an Eigenvalue of 2.68 accounting for 22.4% of the variance. As shown in Table 5, gambling involvement was most highly correlated with intrinsic motivations. The high correlation with amotivation was unexpected. Involvement was positively related to problem gambling and depression.

South Oaks Leisure Activity Screen, (SOLAS; Lesieur & Blume, 1993)

Four groups were created based on their assessment of their interest in gambling activities. Twenty-five respondents who indicated they had no interest in any forms of gambling made up the "no interest" group. Those who had moderate interest (n=131) in at least one form of gambling were included in the "moderate interest" group. Fifty respondents who described themselves as having heavy interest in some form of gambling made up the "heavy interest" group. Those who indicated they had obsessive interest in at least one form

of gambling formed the "obsessive interest" group (n =22).

One-way ANOVAs for intrinsic gambling motivation, extrinsic gambling motivation by identified, introjected and external regulation, gambling amotivation, problem gambling, involvement, self-esteem and depression were conducted. With sharply unequal group size the assumption of homogeneity of the covariance matrices can effect power. When the larger variability is in the smaller group the test is liberal, and when in the larger group the test is conservative (Stevens, 1996). Box test of homogeneity of covariance matrices revealed heterogeneity of variance for the identified, introjected, external, problem gambling, and involvement variables. The larger variability was in the heavy and obsessive groups, which were smaller in number than the moderate group. Therefore it was decided to set alpha at .01 for these analyses. Results revealed significant main effects for intrinsic $F(3, 224) = 28.83$, $p < .000$, identified $F(3, 224) = 29.87$, $p < .000$, introjected $F(3, 224) = 22.92$, external $F(3, 224) = 11.97$, $p < .000$, amotivation $F(3, 224) = 26.44$, $p < .000$, problem gambling $F(3, 224) = 67.72$, $p < .000$, gambling involvement $F(3, 224) = 38.79$, $p < .000$, and depression $F(3, 224) = 5.29$, $p < .002$. Group comparisons were made according to Tukey's HSD method. Group comparisons displaying the transformed means returned to original scale for greater clarity are shown in Table 6.

Respondents who described themselves as being obsessively interested in at least one form of gambling endorsed gambling for all motivations except external regulation more highly than the three other groups. Those who considered themselves to be heavily interested

Table 6

Comparison of Means of Motivations for Gambling, SOGS, and PF Reported by Groups Divided by Interest in Gambling.

Variable	NO (n=25)	MODERATE (n=131)	HEAVY (n=50)	OBSESSIVE (n=22)
GAMIN	1.08_a (.66)	1.38_a (.88)	1.82_a (1.19)	2.83_b (1.33)
GAMID	1.06_a (.80)	1.16_a (.75)	1.38_a (1.16)	2.35_b (1.47)
GAMINT	1.06_a (.75)	1.11_a (.63)	1.25_a (.93)	1.88_b (1.61)
GAMEXT	1.46_a (.99)	2.63_a (1.71)	3.08_b (1.83)	4.22_b (1.67)
GAMAM	1.19_a (.95)	2.17_a (1.44)	2.31_b (1.53)	4.96_c (1.59)
SOGS	12.00_a (8.00)	13.78_a (4.64)	16.16_a (7.18)	32.83_b (12.01)
INVOLVE	$.39_a$ (1.22)	2.57_b (2.35)	5.27_c (4.79)	6.28_d (6.27)
SDS	35.55_a (8.37)	34.37_a (8.84)	36.91_a (8.51)	42.36_b (9.05)
RSE	33.93_a (6.97)	33.80_a (5.54)	33.95_a (6.00)	30.61_a (6.30)

Note. GAMIN = Intrinsic Gambling Motivation, GAMID = Extrinsic Gambling Motivation by Identified Regulation; GAMINT = Extrinsic Gambling Motivation by Introjected Regulation; GAMEXT = Extrinsic Gambling Motivation by External Regulation; GAMAM = Gambling Amotivation; SOGS=Problem Gambling; INVOLVE=Gambling Involvement; SDS=Self-Rating Depression Scale; RSE=Rosenberg Self-Esteem Scale Values enclosed in parentheses represent standard deviation.

Means in the same row that do not share subscripts differ at $p < .01$.

reported gambling for more external and amotivated reasons than the moderate and no interest group members.

Groups differences in endorsement of gambling frequency showed the expected pattern of progressively more involvement by more interested groups. Respondents who considered themselves to be obsessively interested in at least one form of gambling scored significantly higher on the SOGS than the other three groups. Respondents who considered themselves to be obsessively interested in at least one form of gambling scored significantly higher on the self-rating of depression than the other three groups. There were no group differences in self-esteem.

Homogeneity of Sample

In order to investigate the possibility that results inconsistent with Self-Determination Theory (Deci & Ryan, 1990) were attributable to sampling procedures differences on variables between university and non-university respondents were explored. Two groups were formed using answers to the employment item on the demographic sheet. One group was formed by selecting respondents who had indicated that they were students (N=126). A second group was formed by selecting respondents who had indicated that they were other than students (N=102). Two respondents did not indicate their employment status. t-tests revealed that respondents who identified themselves as full or part-time students differed significantly from non-students on intrinsic, identified and introjected gambling motivation, amotivation for gambling, and the SOGS. Results with anti-transformed means are shown in

Table 7. These findings suggest that a more homogeneous sample would result from data collected from either the student population or the non-student population.

Table 7

Comparison of Means of Gambling Involvement, and Gambling Motivation Reported by Groups Divided by Employment

Variable	Student (n=126) Mean	Non-Student (n=102) Mean	t-Value	Probability
INVOLVE	2.47 (3.00)	3.37 (5.13)	2.18 (df=226)	.031
SOGS	13.78 (4.70)	16.16 (12.00)	-4.85 (df=226)	.000
GAMIN	1.82 (.89)	1.62 (1.37)	-2.87 (df=226)	.004
GAMID	1.16 (.63)	1.42 (1.42)	-4.83 (df=226)	.000
GAMINT	1.13 (.72)	1.28 (1.16)	-2.77 (df=226)	.006
GAMEXT	2.63 (1.71)	2.90 (1.87)	1.12 (df=226)	.264
GAMAM	2.09 (1.41)	2.71 (1.93)	2.78 (df=226)	.006

Note. INVOLVE=Gambling Involvement; SOGS=Problem Gambling; GAMIN=Intrinsic Gambling Motivation; GAMID=Extrinsic Gambling Motivation by Identified Regulation, GAMINT=Extrinsic Gambling Motivation by External Regulation, GAMAM=Gambling Amotivation
Numbers in brackets are SD.

Discussion

The goal of this study was to evaluate the proposed measures and to explore the relationships between motivation for gambling, gambling involvement, problem gambling and psychological functioning. Following the observation of some results that were not entirely consistent with the propositions from Self-Determination Theory comparisons of respondents recruited in different settings were conducted. More specifically these analyses involved comparing student and non-students on all variables.

Interpretation of findings of this study must be cautious due to sample limitations. It appeared that a sizable portion of respondents had not gambled in the last year nor had they any interest in gambling. In addition, some members of Gamblers Anonymous indicated on their questionnaires that they had not gambled in the last year, but had gambled heavily in the past. Therefore, it may be that some answers were based on speculation or memory of a time when contextual circumstances that might influence motivation could have been different. In addition, the sample proved to be heterogeneous. Consequently, inclusionary criteria for future studies should include respondents who have gambled at least once in the past year and recruitment procedures should not combine university and non-university populations.

For purposes of parsimony, the three intrinsic motivation sub-scales of the Gambling Motivation Scale were combined to form one intrinsic sub-scale. The structure of this five-factor Gambling Motivation Scale was assessed. The five sub-scales were

found to have good internal consistency. The modified South Oaks Gambling Screen and the gambling involvement measure were each found to have one factor with good internal consistency. However, the modified South Oaks Gambling Screen does not allow for estimation of probable problem and pathological gambling in the sample, and comparison with other research. Therefore, the original version of the South Oaks Gambling Screen was employed in Study 1.

Correlations between sub-scales of the Gambling Motivation Scale departed from the simplex pattern. The most notable deviation was that the Amotivation sub-scale was more highly correlated with the intrinsic motivation sub-scale, and the identified and introjected regulation sub-scales than the adjacent external regulation sub-scale. This finding could have been influenced by the heterogeneity of the sample. It is possible that the interpretation of an item such as "I gamble, but sometimes I get the impression that I don't get much out of it" by a youth who accompanies friends to a gambling establishment for the purpose of companionship is different from the seasoned gambler who is questioning the relationship between the behaviour and the outcome.

The pattern of correlations found between gambling motivation sub-scales and gambling involvement, the South Oaks Gambling Screen and psychological functioning measures did not clearly support or refute the tenets of Self-Determination Theory concerning regulation style and consequences. The high correlation of the intrinsic motivation for gambling sub-scale with gambling involvement provides some support for the Self-Determination Theory tenet that more self-determined reasons for engaging in an

activity should lead to greater involvement in that activity. However, gambling involvement was positively correlated with the SOGS and the SDS, and negatively related to the RSE suggesting that high degree of involvement is associated with negative consequences. This finding underscores the intriguing question concerning the relationship between self-determined reasons for engaging in an activity, involvement in that activity, and outcome of the activity when the activity can result in positive and negative consequences. All gambling motivations were significantly correlated with depression, with the introjected sub-scale showing the strongest association. The more self-determined motivations for gambling showed no relationship to self-esteem, however the less self-determined forms were negatively correlated with this construct which suggests that less self-determined forms of regulation are associated with poorer psychological functioning.

Differences between groups divided by self-described interest levels also did not show a clear pattern of support or rebuttal of the Self-Determination Theory. The heavy interest group reported gambling for more intrinsic reasons than did the moderately interested group. This group also reported more involvement in gambling but not more problems or depressive symptoms. This finding suggests that individuals who engage in a potentially problematic activity for more self-determined reasons, and engage in it more frequently than do less interested groups, do not experience negative consequences. These results provide some support for the tenets of Self-Determination Theory. The obsessive group endorsed all reasons for gambling more than the other groups and more

involvement. This group was the only group that scored significantly higher on the measure of gambling problems and higher on depression than other groups. It appears that individuals who experienced their interest in gambling as obsessive showed a different pattern of relationship between gambling motivation, involvement and consequences. This pattern does not conform to the proposals of Self-Determination Theory.

In summary, the relationships between motivation, involvement, problem gambling, and psychological functioning found in this study did not completely support or refute the tenets of Self-Determination Theory. There are several possible reasons for the divergence from relationships previously found by researchers of the Self-Determination Theory. It may be that findings of this study are domain specific, that is, distinctive of gambling. There may be something about a potentially problematic activity like gambling that influences the way the activity is regulated. Alternatively, the Gambling Motivation Scale may not adequately represent motivations for gambling that are consistent with the propositions of Self-Determination Theory. It may be that propositions concerning the relationship between self-determined motivations and consequences may be limited to functional activities, and not applicable to potentially problematic activities. Finally, lack of clear-cut findings may have been influenced by the sample limitations. Recruitment procedures and the motivational model tested in Study 1 should attempt to address these possibilities. The more powerful and sophisticated analytical method of structural equation modelling should also be used in Study 1.

STUDY 1

The goal of Study 1 was to test a motivational model incorporating the domains of leisure and gambling and their consequences based on Self-Determination Theory (Deci & Ryan, 1990) and Vallerand's hierarchical model (1997) of self-determination. The domain of leisure has previously been explored using Self-Determination Theory, allowing comparison of the results of this study to previous findings and test of sample specificity. Adoption of Vallerand's hierarchical model afforded the opportunity to replicate the relationship between global self-determination and contextual self-determination for a domain considered to be functional, that of leisure. Balancing this domain with one that is potentially problematic, specifically gambling, provided a comparison of the relationships between global and domain specific self-determination and contextual self-determination and consequences for functional and problematic behaviours. This comparison served as a test of the appropriateness of using the Self-Determination Theory with a potentially problematic behaviour. In addition, including the top-down global to contextual paths in the model provided a means of assessing the constructs of the Gambling Motivation Scale as representative of self-determination for gambling. Finally, assessment of global motivation allowed us to evaluate the global motivational profile of people involved in gambling as well as the associations between global levels of self-determination and levels of self-determination for gambling behaviour, gambling involvement, and gambling problems.

This study was a cross-sectional questionnaire survey. The categories of variables

surveyed were: global motivational orientation, leisure activities motivation, gambling motivation, positive consequences of leisure activities, involvement in gambling, assessment of problem gambling, and psychological functioning. To achieve a more homogeneous sample than was attained in the pilot study, data collection were conducted with the gambling population at large and the more restrictive population of university students was not included. The structure and construct validity of the motivational measures of leisure and gambling were evaluated prior to testing the model. The Self-depression Inventory used in the pilot study, which is designed for a pathological population, was replaced with the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). This scale is intended for use with cross-sectional samples in survey research. In addition, the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffen, 1985) was added to increase the scope of the psychological functioning construct. The proposed model was assessed using structural equation modelling.

Hypotheses

I Based on previous findings, it was hypothesized that high global self-determination would be positively correlated with high leisure self-determination and negatively correlated with low leisure self-determination.

II Based on previous findings, it was hypothesized that high leisure self-determination would be positively correlated with positive leisure consequences and negatively correlated with positive leisure consequences.

III Based on previous findings, it was hypothesized that positive leisure consequences

would be positively associated with the psychological functioning construct.

IV Based on Vallerand's hierarchical model, it was hypothesized that high global self-determination would be positively correlated with high gambling self-determination and negatively correlated with low gambling self-determination.

V Based on previous findings, it was hypothesized that high gambling self-determination would be positively correlated with gambling involvement.

VI Based on gambling research, it was hypothesized that gambling involvement would be associated with gambling problems.

VII Based on Self-Determination Theory, it was hypothesized that gambling involvement would be positively related to the psychological functioning construct.

VIII Based on Self-Determination Theory, it was hypothesized that low gambling self-determination would be positively correlated with problem gambling.

IX Based on gambling research, it was hypothesized that problem gambling would be negatively related to the psychological functioning construct.

Method

Procedure

Two procedures were employed. First, participants received a questionnaire package that contained: (a) a cover letter explaining the purpose of the study and instructions for completing the questionnaire (b) a measure of global motivation (c) a measure of leisure motivation (d) a measure of positive leisure consequences (e) a leisure activity screen (d) a measure of gambling motivation (e) a problem gambling screen (f) measures of psychological functioning (g) a demographic questionnaire (see Appendix B). The cover letter informed respondents that the purpose of the study was to investigate the relationship between people's perceptions of themselves and their reasons for engaging in gambling activities. It was explained that participation involved filling out the package of questionnaires and mailing them in the provided postage-paid envelope. In addition, this letter explained that participation was voluntary and requested that respondents not put their names on the questionnaire so that the answers would be anonymous. Respondents were encouraged not to leave any items unanswered, but to pick the response that best described their thoughts and feelings for the item. Telephone numbers of the investigators were provided with an invitation to telephone with questions and concerns, as well as the telephone number of the Ontario problem gambling hotline.

Second, the questionnaire was published on the Internet. The same cover page was provided with three modifications. First, participants were directed to click buttons that represented their chosen answers and then click the submit buttons at the end of each of

the three sections to register their answers. Second, a link with the principal investigator's e-mail address was provided as a means of contact with concerns or questions. Third, the telephone number of the Ontario problem gambling hotline was not provided because the location would not necessarily be appropriate. Questions concerning age, income and education in the demographic questionnaire were adapted to the Internet by replacing the fill-in-the blank format with ranges offered for selection.

In order to maximally protect respondents' anonymity, an actual consent form was not included in the study. It was assumed that if respondents completed the questionnaire and returned it, this could be considered an indication of their consent.

Mode of Recruitment of Participants

Seven modes of recruitment were followed. The first canvassed clients of Casino Amusements Canada. Casino Amusements Canada organizes junkets to casinos in the United States and provides bus service from pick-up points in Toronto to Casino Rama in Orillia. Separate client lists exist for each service. The names and addresses of the 388 clients who had used the junket service and the 7184 clients who had used the bus service were printed out alphabetically. The pages were shuffled, and 200 from each group were randomly selected. Four hundred questionnaires were mailed from the offices of Casino Amusements Canada, with a cover introductory letter from the President (see Appendix B). Twenty-one of these questionnaires were completed and returned (5%). Several months later, users of the junket service were contacted by phone and asked to participate in the study. Questionnaires were mailed to the 90 people who consented, resulting in a

return of 29 questionnaires (32%).

As a second approach, adults attending a meeting of Gamblers Anonymous (GA) were recruited by the investigator with the prior permission of the chairperson. The chairperson also took a supply of questionnaires to distribute to chairpersons of other chapter meetings of GA. Six of these 50 questionnaires were returned (12%).

The third method of recruitment was the "snowball" technique. Acquaintances of the investigator were asked to distribute questionnaires to people they believed to participate in gambling. Three hundred questionnaires were distributed in this fashion, resulting in 55 completed questionnaires (18%).

Fourth, the owner of a shuttle service providing transportation to and from various hotels in Ottawa and the Hull Casino consented to ask his drivers to present passengers with questionnaires on their return trip from the casino. Three hundred and sixty questionnaires were provided by the investigator, two of which were returned (.5%).

The fifth method involved two charity trips from the City of Brockville to the Hull Casino. The investigator boarded the 46-seat buses prior to departure and asked passengers to participate in this research by filling in the questionnaire during the bus trip to the Casino. The investigator then met the buses at the Casino and collected a total of 40 completed questionnaires (43%).

The sixth approach was to make the questionnaire available for completion on the University of Ottawa, School of Psychology website. Thirty-five organizations with websites providing information on gambling, or on problem gambling assistance, were

contacted to request the establishment of links to the questionnaire. Six organizations complied. A notice of the research and availability of the questionnaire was posted on a Carleton University Today's electronic news bulletin. Sixty-two respondents were recruited via the Internet.

Participants

The sample was comprised of 109 men and 106 women (N=215). Ages ranged from the twenties to the nineties with the modal range in the fifties. One hundred and fifty respondents were employed, eight were students, five received disability benefits, 37 were retired, six were unemployed, two were homemakers, and seven did not indicate their employment status. Personal incomes ranged from less than $19,000.00 to greater than $120,000.00. The modal income range was between $20 and 39 thousand dollars. One hundred and seventy-four respondents indicated that they had completed grade twelve, 110 had attended university, and 86 had attended college or trade school. Eight respondents did not indicate their schooling. One hundred and thirty-nine were partnered, sixty nine were single, divorced, or widowed and seven did not indicate their relationship status.

Measures

Global Self-Determination Scale (GMS; Guay et al., 1996). The GMS is a 32-item questionnaire. Items represent potential answers to the question: "Why do you generally do things"? (Examples are presented in Table 8). These items are scored on a 7-point Likert-type scale anchored by the endpoints *does not correspond at all* (1) and

Table 8

Examples of Items for Each Sub-scale of the Motivational Scales

Sub-scale	Example of GMS (In general, I do things.....)
Intrinsic Motivation for Knowledge	For the pleasure of acquiring new knowledge.
Intrinsic Motivation for Accomplishment	Because of the pleasure I feel as I become more and more skilled.
Intrinsic Motivation for Stimulation	For the pleasant sensations I feel while I am doing them.
Identified Regulation	In order to help myself become the person I am to be.
Introjected Regulation	Because otherwise I would feel guilty for not doing them.
External Regulation	Because I want to be viewed more positively by certain people.
Amotivation	Although I do not see the benefit in what I am doing.

Sub-scale	Example of LMS (Why do you generally do your leisure activities?)
Intrinsic Motivation for Knowledge	For the pleasure I feel in living exciting experiences.
Intrinsic Motivation for Accomplishment	For the pleasure I feel when I outdo myself in interesting activities.
Intrinsic Motivation for Stimulation	For the pleasure I feel in living exciting experiences.
Identified Regulation	Because it's one of the ways that I have chosen to make improvements on a personal level.
Introjected Regulation	Because in life you absolutely need leisure activities to be happy.
External Regulation	Because I don't like to appear as someone who does nothing.
Amotivation	I don't really know; I don't think that leisure activities suit me.

Table continues

Sub-scale	Example of GAMS (Why do you gamble at your favourite game?)
Intrinsic Motivation for Knowledge	For the pleasure I get when I improve my knowledge of the game.
Intrinsic Motivation for Accomplishment	For the satisfaction I get when I can control the game.
Intrinsic Motivation for Stimulation	Because of the enormous rush I get.
Identified Regulation	Because it is the best way for me to relax completely.
Introjected Regulation	Because it makes me feel important.
External Regulation	I gamble to become rich.
Amotivation	I gamble, but sometimes I wonder what it does for me.

corresponds exactly (7). The GMS comprises eight sub-scales that correspond to eight types of motivation: intrinsic motivation to know, to accomplish things, and to experience stimulation, extrinsic motivation by identified regulation, integrated regulation, introjected regulation, external regulation, and amotivation. To keep the questionnaire as short as possible in order to maximize compliance, only three of the four items from each of the eight sub-scales were used. Reliability analysis previously conducted on this instrument (Haddad, 1999) was consulted, and the item that resulted in the highest Cronbach alpha if removed was eliminated. Internal consistency values of the eight shortened sub-scales were previously found to be .89 for Intrinsic Motivation to Know, .84 for Intrinsic Motivation to Accomplish, .84 for Intrinsic Motivation to Experience Stimulation, .80 for Identified Regulation, .86 for Integrated Regulation, .84 for Introjected Regulation, .75 for External Regulation, and .74 for Amotivation (Haddad, 1999). In the

current study these sub-scales had Cronbach alphas of .90, .85, .79, .74, .78, .85, .81, .70 respectively. The GMS has shown good factorial structure, psychometric properties, and a simplex pattern of correlation (Vallerand, 1997).

For the sake of parsimony and as recommended in most structural equation modelling (SEM) procedures (Vallerand, 1997) Global Self-Determination indices were created to represent the latent construct Global Self-Determination in SEM. Indices were created by weighting each item of the GMS according to the position of the sub-scale on the self-determination continuum, and then summing the weighted scores, resulting in three indices. One form of intrinsic motivation (stimulation, knowledge, accomplishment) was used for each index. In agreement with past research (Blais, et al., 1990; Green-Demers, Pelletier, & Menard, 1997) the following formula was used: [(3 x Intrinsic Motivation) + (2 x Integrated Regulation) + Identified Regulation] - [Introjected Regulation + (2 x External Regulation) + (3 x Amotivation).

Leisure Motivation Scale (LMS; Pelletier, Green-Demers & Dion, 1998). The Leisure Motivation Scale is a 28-item questionnaire. Items represent potential answers to the question: "Why do you generally do your leisure activities"? (Examples are presented in Table 8). These items are scored on a 7-point Likert-type scale anchored by the endpoints *does not correspond at all* (1) and *corresponds exactly* (7). The LMS comprises seven sub-scales that correspond to seven types of motivation: intrinsic motivation for knowledge, accomplishment , and stimulation, extrinsic motivation by identified, introjected, and external regulation, and amotivation. There is no integrated sub-scale for

this scale. To keep the questionnaire as short as possible in order to maximize compliance, only three of the four items from each of the seven sub-scales were used. Reliability analysis previously conducted on this instrument (Pelletier et al., 1995) was consulted, and the item that resulted in the highest Cronbach alpha if removed was eliminated. Internal consistency values of the seven shortened sub-scales were: .75 for Intrinsic Motivation to Accomplish, .78 for Intrinsic Motivation to Know, .67 for Intrinsic Motivation to Experience Stimulation, .70 for Identified Regulation, .61 for Introjected Regulation, .64 for External Regulation, and .56 for Amotivation. Cronbach alphas for the current study were: .81, .86, .72, .87, .60, .74, .84 respectively. The LMS has shown good factorial structure and a simplex pattern of correlation between sub-scales (Pelletier et al., 1995). Construct validity of the seven sub-scales has been supported by a series of correlations between the sub-scales and variables serving as pertinent antecedents and consequences of leisure activity (Pelletier et al., 1995).

For the purposes of parsimony three indicators were created by adding one of each intrinsic type and one identified item score from the LMS to represent the latent construct High Leisure Self-Determination in SEM. Another three indicators were created by adding one of each introjected, external and amotivated item scores to represent the latent construct Low Leisure Self-Determination.

Gambling Motivation Scale, (GAMS; Chantal, Vallerand, & Vallières, 1995). The GAMS is a 28-item questionnaire. Items represent potential answers to the question: "Why do you gamble?". (Examples are presented in Table 8). These items are scored on a

7-point Likert-type scale anchored by the endpoints *does not correspond at all* (1) and *corresponds exactly* (7). The GAMS comprises seven sub-scales that correspond to seven types of motivation: intrinsic motivation for knowledge, accomplishment and stimulation, extrinsic motivation by identified, introjected, and external regulation, and amotivation. For the purposes of parsimony one item that resulted in the highest Cronbach alpha was eliminated from each sub-scale. Cronbach alphas for these reduced sub-scales were: .86 for Intrinsic Motivation to Accomplish, .86 for Intrinsic Motivation to Know, .93 for Intrinsic Motivation to Experience Stimulation, .88 for Identified Regulation, .79 for Introjected Regulation, .85 for External Regulation, and .85 for Amotivation.

The factorial structure of the French version of the GAMS (ÉMJHA) has been demonstrated by Chantal et al., (1994) and the factorial structure of the English GAMS was supported in the Pilot Study. The existence of a simplex pattern of correlations between the ÉMJHA sub-scales supporting the hypothesis of a continuum of self-determination has been shown (Chantal et al., 1994). This same pattern has been found with variables pertinent to gambling, providing evidence of construct validity (Chantal et al., 1994).

For the purposes of parsimony, three indicators were created by adding one of each intrinsic type and one identified item score from the GAMS to represent the latent construct High Gambling Self-Determination. Three more indicators were created by adding one of each introjected, external and amotivated item scores to form the construct Low Gambling Self-Determination.

Leisure Activity Consequences (LAC). The LAC was adapted from the Rochester Assessment Package for Schools (Wellborn & Connell, 1987). This 12-item scale has been used in research on self-determination. It has been adapted for specific domains of leisure (Pelletier et al. 1996; Pelletier et al., 1998), education (Vallerand et al., 1993), sport motivation (Pelletier et al., 1995) and client motivation for therapy (Pelletier, Tuson, & Haddad, 1997) and displayed satisfactory reliability and validity. Items are scored on a 7-point Likert-type scale anchored by the endpoints *does not correspond at all* (1) and *corresponds exactly* (7). The Cronbach alpha for this study was .74. It represents potential answers to the question "How do you feel when you practice your leisure activities?" and consists of statements concerning distraction, positive emotion, feelings of choice or freedom, and stress. Distraction and stress are considered to be negative consequences and feelings of positive emotion and freedom are positive consequences. Negative items were re-coded to form a positive construct. For the purposes of SEM three indicators to represent the latent construct Positive Leisure Consequence (PLC) were formed by combining two positive and two negative items from the LAC in order to equalize the measurement weighting across indicators.

The South Oaks Gambling Screen, (SOGS; Lesieur & Blume, 1987). The SOGS is the most widely used screen for gambling problems. This screen is a 16-item self-report questionnaire based on a modification of the DSM-III diagnostic criteria for pathological gambling. As recommended by the authors, only 13 of these items are used in the scoring

of problem gambling. One of the 13 items consists of 9 sub-items, resulting in a possible score of 21. The SOGS assesses problems in seven domains: family disruption, job or school disruption, lying about gambling, default on debts, going to someone to relieve a desperate financial situation that has resulted from gambling activity, borrowing from illegal sources to finance gambling and committing an illegal act to finance gambling. A score of 5 indicates pathological gambling, and scores of 3 or 4 have been used to classify individuals as problem gamblers. It has been found to be highly correlated with assessments based on the DSM-III-R criteria (r=.94) indicating good validity. Internal consistency is high (Cronbach's alpha=.97). Test-retest correlation (using a dichotomous classification of pathological or nonpathological) was 1.0 for outpatients. For the purposes of SEM three indicators representing the construct Problem Gambling were formed by combining the 21 items from the SOGS according to content in order to equalize the measurement weighting across indicators. One indicator was comprised of 6 items, and two contained 7 items.

Gambling Involvement (Involve). Gambling involvement was calculated by summing respondents' answers to question 1 of the SOGS (SOGS; Lesieur & Blume, 1987) concerning frequency of gambling. Question 1 does not represent assessment of problem gambling and is not included in the scoring of problem gambling. Respondents are asked to indicate which of 12 types of gambling listed they have done in the last year, with a thirteenth option of "some form not listed". Choices are: 1=not at all, 2=less than once a week, 3=once a week or more. For purposes of statistical analysis these answers

were recoded so that selection of "not at all" was assigned a 0, "less than once a week" a 1, and "once a week or more" a 2. These 13 items were then summed to form a measure of frequency of gambling activity. For the purposes of SEM three indicators representing the construct of Gambling Involvement were formed, three containing 4 items, and one representing 5 items.

Psychological Functioning (PF). Following the procedure of Pelletier et al. (1995), measures were taken from the mental health assessment domain and combined to form a second-order factor of psychological functioning. Two positive constructs, self-esteem and satisfaction with life, were combined with the negative construct of depressive symptoms. Self-esteem was measured by the Rosenberg Self-esteem Scale, life-satisfaction with the Life Satisfaction Scale, and depression with the Centre for Epidemiologic Studies Depression Scale. Rosenberg Self-Esteem Scale, (RSE; Rosenberg, 1979). The purpose of the RSE is to measure self-esteem. The RSE consists of 10 items. Internal consistencies of Cronbach alpha .77 and .88 have been obtained in previous research. Cronbach alpha was .88 in this study. Test retest correlations range from .82 to .85. It has been found to correlate with the Feelings of Inadequacy Scale (r=.75) and the Self-description Inventory (r=.64) (Kahle, 1976). Centre for Epidemiologic Studies Depression Scale, (CES-D; Radloff, 1977). The CES-D is designed to assess current frequency of depressive symptoms and was intended for use with cross-sectional samples in survey research. The CES-D is a 20-item instrument developed to measure depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of

appetite, and sleep disturbance. Respondents are asked to indicate how frequently they experienced the symptom within the past week on a 4-point rating scale from "rarely or none" of the time to "most or all of the time". Split-half correlations have been reported to be .85 for patient groups and .77 for normal groups. Internal consistencies of Cronbach alpha .90 or above have been obtained in previous research. Cronbach alpha was .90 in this study. Test-retest reliabilities ranging from .32 for 12 months to .67 for 4 weeks have been reported. The CES-D has been found to correlate with the Beck Depression Inventory (Beck, 1961) (r=.81) and the Zung Depression Scale (SDS; Zung, 1965) (.90) (Shaver & Brennan, 1991). Satisfaction with Life Scale, (SWLS; Diener, Emmons, Larson, & Griffin, 1985). The SWLS is designed to assess global life satisfaction. The scale has been shown to have good internal consistency (Cronbach alpha = .87 in previous research and in this study) and retest correlation was r=.82. The SWLS correlates (r=.68) with interview ratings of global life satisfaction, and has moderately strong correlations with subjective well-being scales (Diener et al., 1985). For the purposes of SEM, each scale formed one indicator of the Psychological Functioning construct.

Statistical Analyses

Data analysis consists of (a) preliminary analyses, (b) descriptive analyses, and (c) structural equation modelling procedures. Preliminary analyses were screening procedures to ensure structural equation modelling (SEM) assumptions were met. Descriptive analyses provided summary statistics, correlations, and group differences.

SEM procedures were carried out in two stages using the program LISREL VIII

(Joreskog & Sorbom, 1996a, 1996b). First, the measurement model was tested. Confirmatory factor analyses (CFA) procedures were used to test the validity of the Leisure Motivation Scale and the Gambling Motivation Scale. Second, a structural model based on the pattern of relationships (Figure 3) was specified. There was one endogenous variable in the structural model (Global Self-Determination) which was assessed by three indicator variables. There were 8 endogenous variables (High Leisure Self-Determination, Low Leisure Self-Determination, High Gambling Self-Determination, Low Gambling Self-Determination, Positive Leisure Consequences, Gambling Involvement, Problem Gambling, and Psychological Functioning which were assessed by 25 indicator variables, along with their associated error terms. The same measures of fit outlined in Study 1 were used to assess the proposed model.

As depicted in Figure 3, direct paths were hypothesized as follows: Global Self-Determination would be associated with Gambling and Leisure Self-Determination. High Leisure Self-Determination would be positively, and Low Leisure Self-Determination would be negatively associated with Positive Leisure Consequences. Positive Leisure Consequences would be positively associated with Psychological Functioning. High Gambling Self-Determination would be associated with Gambling Involvement and Low Gambling Self-Determination with Problem Gambling. Gambling Involvement would be positively associated with Problem Gambling and Psychological Functioning. Problem Gambling would be negatively associated with Psychological Functioning.

Results

Preliminary Analyses

Prior to analysis variables were examined through various SPSS programs for missing values, normality, linearity, and the presence of outliers. Skewness and kurtosis were evaluated using a criterion of z score 3.67 above or below zero (p=.001). Cases with standardized scores in excess of plus or minus 3.67 were considered to be univariate outliers. Multivariate outliers were identified according to Mahalanobis distance criterion of p<.001. This research was considered to be exploratory, therefore, group comparisons were evaluated using a .05 alpha level unless otherwise specified.

Missing data

Nine cases missing one to three values were identified. The randomness of omissions was tested by forming two groups based on missing and nonmissing data and testing for patterns in missing data. No differences were found on variables that were proposed to be related to the variables with missing data. The mean of the respective sub-scale was used to replace the missing values. On the demographic section, twenty-one respondents did not indicate their income. This demographic information is not required for the CFAs or SEM, therefore these cases were retained.

Normality

The summary statistics of all the variables involved in the study were examined. The means, standard deviations, kurtosis and skewness values of the indicators used in the analyses are shown in Tables 9, 10, and 11.

Table 9

Summary Statistics for the Indicators of the Leisure Motivation Scale CFA

Variables	Mean	Standard Deviation	Kurtosis	Skewness	Range
Intrinsic Leisure Motivation (LIN)	4.72	1.08	- .11	- .30	1-7
LIN Stimulation	4.76	1.30	.00	- .52	1-7
LIN Knowledge	4.86	1.35	- .01	- .50	1-7
LIN Accomplishment	4.51	1.34	- .41	- .35	1-7
Identified Leisure Regulation (LIDEN)	4.65	1.46	- .20	- .54	1-7
LIDEN1	4.64	1.69	- .42	- .61	1-7
LIDEN2	4.55	1.65-	.59	- .43	1-7
LIDEN3	4.75	.65	- .22	- .68	1-7
Introjected Leisure Regulation (LINTR)	3.84	1.34	- .62	.02	1-7
LINTR1	5.04	.12	- .32	- .77	1-7
LINTR2	2.96	.12	- .54	.65	1-7
LINTR3	3.52	.12	-1.09	.22	1-7
External Leisure Regulation (LEXT)	2.59	1.28	.96	1.09	1-7
LEXT1	2.28	1.52	1.41	1.36	1-7
LEXT2	3.26	1.72	- .71	.44	1-7
LEXT3	2.24	1.48	.83	1.26	1-7
Leisure Amotivation (LAM)	1.70	1.05	3.74	1.94	1-7
LAM1	1.81	1.33	2.92	1.85	1-7
LAM2	1.73	1.21	3.17	1.92	1-7
LAM3	1.56	1.12	7.97	2.70	1-7

Table 10

Summary Statistics for the Indicators of the Gambling Motivation Scale CFA

Variables	Mean	Standard Deviation	Kurtosis	Skewness	Range
Intrinsic Gambling Motivation (GAMIN)	2.62	1.50	- .231	.82	1-7
GAMIN Stimulation	3.03	1.99	- .91	.62	1-7
GAMIN Knowledge	2.42	1.53	.23	1.03	1-7
GAMIN Accomplishment	2.42	1.60	.39	1.24	1-7
Identified Gambling Regulation (GAMID)	2.40	1.61	.16	1.20	1-7
GAMID1	2.46	1.77	.19	1.10	1-7
GAMID2	2.12	1.66	1.13	1.46	1-7
GAMID3	2.61	1.93	- .26	.98	1-7
Introjected Gambling Regulation (GAMINT)	1.73	1.15	4.09	2.00	1-7
GAMINT1	1.71	1.37	4.36	2.21	1-7
GAMINT2	1.34	.89	16.30	3.66	1-7
GAMINT4	2.13	1.69	1.04	1.43	1-7
External Gambling Regulation (GAMEXT)	2.78	1.81	- .65	.77	1-7
GAMEXT1	2.87	2.13	- .85	.78	1-7
GAMEXT2	2.40	1.91	.07	1.18	1-7
GAMEXT3	3.08	2.15	-1.05	.60	1-7
Gambling Amotivation (GAMAM)	2.02	1.31	- .13	.92	1-7
GAMAM2	2.48	1.90	- .07	1.06	1-7
GAMAM3	2.88	1.99	- .60	.80	1-7
GAMAM4	2.72	2.08	- .53	.92	1-7

Table 11

Summary Statistics for the Indicators of the Problem Gambling Model

Variables	Mean	Standard Deviation	Kurtosis	Skewness	Range
Global Self-Determination Index (GSDI)	9.90	6.92	.08	.37	-36-+36
GSDI1	8.80	7.87	.36	- .01	-36-+36
GSDI2	9.68	8.04	- .16	.23	-36-+36
GSDI3	11.21	8.47	.24	- .00	-36-+36
High Leisure Self-Determination (HILSD)	4.68	1.20	- .28	- .43	1-7
HILSD1	4.71	1.28	- .08	- .52	1-7
HILSD2	4.70	1.83	- .32	- .38	1-7
HILSD3	4.63	1.32	- .03	- .54	1-7
Low Leisure Self-Determination (LOLSD)	2.71	.90	.88	.74	1-7
LOLSD1	3.04	.99	.20	.19	1-7
LOLSD2	2.65	1.07	.14	.55	1-7
LOLSD3	2.44	1.06	.59	.75	1-7
High Gambling Self-Determination (HIGAMSD)	2.51	1.41	.18	.95	1-7
HIGAMSD1	2.74	1.69	- .27	.81	1-7
HIGAMSD2	2.27	1.32	.50	1.07	1-7
HIGAMSD3	2.51	1.51	.27	.99	1-7
Low Gambling Self-Determination (LOGAMSD)	2.40	1.14	.15	.77	1-7
LOGAMSD1	2.35	1.22	.49	.90	1-7
LOGAMSD2	2.21	1.09	- .32	.69	1-7
LOGAMSD3	2.64	1.47	.41	.95	1-7
Positive Leisure Consequences (LEISCONS)	51.44	8.86	- .19	- .23	12-84
LEISCON1	17.67	3.73	- .23	- .26	4-28
LEISCON2	16.46	3.44	- .04	- .12	4-28
LEISCON3	17.30	3.55	- .20	- .18	4-28
Gambling Involvement (INVOLVE)	5.58	2.99	1.05	.80	0-26
FREQ1	1.24	1.36	1.64	1.24	0-8
FREQ2	2.86	1.32	.61	.24	0-8
FREQ3	1.47	1.28	1.69	1.12	0-9

Table continues

Problem Gambling (SOGS)	2.09	3.83	4.98	2.36	0-20
SOGSA	.65	1.33	4.96	2.33	0-6
SOGSB	.81	1.54	3.77	2.15	0-7
SOGSC	.62	1.20	8.37	2.72	0-7
Psychological Functioning (PF)					
CES-D	69.04	10.27	2.65	-1.58	20-80
SWLS	23.83	6.50	- .28	- .57	5-35
RSE	34.13	5.46	.46	- .97	10-40

The three leisure amotivation items, and sub-scale as a whole, showed significant kurtosis (kurtosis = 2.9 to 7.9) and one item was positively skewed as well (skewness=2.7). Logarithmic transformation was applied to the three amotivation items which reduced kurtosis and skewness values of two items to below criterion (kurtosis=.443 and .755; skewness=1.25 and 1.33). Kurtosis and skewness of the third item was substantially reduced (kurtosis=2.8; skewness=1.8) and the sub-scale distribution was normal. The transformed variables were considered to be acceptable.

Two introjected motivation for gambling items had skewness and kurtosis values in excess of criterion, (skewness=2.2 and 3.6; kurtosis=4.3 and 16.3) and the sub-scale showed significant kurtosis (kurtosis=4.1). Inverse transformation was applied to all three identified gambling items, following exploration of logarithmic transformation. Inverse transformation resulted in normal distribution for two items (kurtosis=-.30 and -1.39; skewness=-1.16 and -.607). Values for the third were substantially reduced (kurtosis=2.16; skewness=-1.88), and the sub-scale as a whole was normally distributed. The transformed variables were considered to be acceptable.

The three variables created from the South Oaks Gambling Screen showed significant skewness and kurtosis (skewness= 2.1 to 2.7; kurtosis=3.7 to 8.3). Logarithmic transformation resulted in skewness and kurtosis values below criterion (skewness=1.39 to 1.55; kurtosis=.16 to 1.23) . The CES-D variable showed significant kurtosis (2.6). It was decided to retain this variable in its original form in order to retain similar score ranges for the indicators of the Psychological Functioning construct.

Kurtosis values for the remaining variables ranged from -1.09 to 1.64, and skewness values ranged from -.97 to 1.46. These values were considered to be within acceptable range, and the variables to be normally distributed.

Linearity

Linearity was assessed by inspecting a random selection of bivariate plots. Distributions appeared to be linear.

Outliers

Investigation of univariate and multivariate outliers was carried out separately for variables used in the CFAs of the Leisure Motivation Scale, the Gambling Motivation Scale, and the SEM analysis. Two univariate outliers were found on the transformed Leisure Amotivation variable. Three multivariate outliers were identified. A dummy grouping variable was created and regression analysis was performed in order to discover why these cases were extreme. Inspection revealed that these respondents had scored very high on at least one Amotivation item, and very low on another. All outliers were eliminated from the CFA of the Leisure Scale (N=210). No univariate outliers were identified on the Gambling

Motivation Scale items. Six cases were found to be multivariate outliers. Examination of these cases revealed that scores on items within sub-scales were very high and very low. These cases were eliminated from the CFA of the Gambling Motivation Scale (N=209).

Two cases were identified as univariate outliers on frequency indicators of the Gambling Involvement construct for the SEM analysis. These cases were considered to be part of the population intended to be sampled and were not eliminated. The scores were changed to be equal to the next most extreme score in the distribution in order to reduce the deviancy (Tabachnick & Fidell, 1989, p. 70). One case was found to be a univariate outlier on the CES-D scale. This score was also changed to be equal to the next most extreme score. Three multivariate outliers were found. Examination of these cases revealed that scores on items within sub-scales were very high and very low. These cases were eliminated from the SEM (N=212).

Homoscedasticity

The bivariate scatterplots were also inspected to identify uneven distributions of the variance in scores on the variables. No evidence of heteroscedasticity was found.

Multicollinearity

Correlations between all possible pairs of variables included in the analyses were scanned for multicollinearity. There were no correlations in excess of .90 (Tabachnick & Fidell, 1989, p.87).

Descriptive Statistics

Global Self-Determination

The theoretical range of the global self-determination score is -36 to +36. Negative scores indicate overall non self-determined motivation. Positive scores indicate global self-determined motivation. The global self-determination index scores ranged from -5.00 to +34.65, with an average of 9.90 (SD=6.92) falling above the mid-point of the possible range (0) indicating that the majority of respondents were relatively self-determined in their life in general.

Leisure Motivation

Scores on the leisure motivation sub-scales ranged from 1 to 7, with the exception of the Leisure Amotivation sub-scale, where scores ranged from 1 to 6. The means of the five leisure self-determination sub-scales were: intrinsic motivation = 4.7 (SD=1.08), identified regulation = 4.6 (SD=1.46), introjected regulation = 3.8 (SD=1.34), external regulation = 2.5 (SD=1.28), leisure amotivation = 1.7 (SD=1.05). The means of the high and low Leisure Self-determination constructs were 4.71 (SD=1.20) and 2.71 (SD=.90). These means indicate that the more self-determined forms of leisure motivation were more highly endorsed by respondents than were the less self-determined forms.

Gambling Motivation

Scores on the gambling motivation sub-scales ranged from 1 to 7, with the exception of the Gambling Amotivation sub-scale, where scores ranged from 2 to 5. The most highly endorsed motivation for gambling was external regulation (M=2.7; SD= 2.81), followed by

intrinsic motivation (M=2.6; SD=1.50), identified regulation (M=2.4; SD=1.16), introjected regulation (M=1.73; SD=1.15) and gambling amotivation (M=1.7; SD=1.31). All means fell below the theoretical mid-point of 3.5 suggesting that for the majority of respondents that statements corresponded "a little" with their reasons for gambling. The means of the High and Low Gambling Self-Determination constructs were 2.51 (SD=1.41) and 2.40 (SD=1.14). These means suggest that autonomous and controlled motivations for gambling were equally endorsed by respondents.

Positive Leisure Consequences

Scores on the positive leisure consequences scale ranged from 29 to 71, with a mean of 51.4 (SD=8.8). The theoretical range of this scale is 12 to 86. The observed mean therefore fell close to the theoretical mean of 49.

Gambling Involvement

Scores on the gambling involvement measure ranged from 0 to 16, with a mean of 5.58 (SD=2.9). The theoretical range of this scale is 0 to 26. Despite the inclusionary criteria of having gambled in the last year, four respondents indicated that they had not engaged in any form of gambling over the past year. These cases were removed (N=205). The mean score suggests that most respondents engaged in at least one form of gambling once a week or more, or five different forms less than once a week.

Problem Gambling

Scores on the SOGS ranged from 0 to 17 (M=2.09, SD=3.83). Thirty-eight (18%) of the respondents' scores were greater than or equal to 4, the cut-off score chosen for this

research for indication of probable problem gambling. As previously mentioned, estimates of current problem gamblers in Canada range from 1.9% to 4.0%. The higher percentage in this sample is the result of an effort to "over-sample" a gambling population to reduce the number of participants that would be required for this study to have a meaningful number of respondents representing problem gamblers.

Psychological Functioning

Depression scores (CES-D) ranged from 0 to 54, with a mean of 10.47 (SD=9.64). Considering that the theoretical range is 0-60 (M=30) respondents' scores represented close to the full range, and the majority indicated low levels of depression. Similarly, self-esteem scores (RSE) ranged from 16 to 40 with a mean of 34.13 (SD=46). The theoretical range of the RSE is 10 to 40, with a mean of 15. Therefore, although some respondents reported relatively low levels of self-esteem, the majority considered themselves to have moderately good self-esteem. Finally, satisfaction with life scores reflected the same tendency. Respondents' scores ranged from 6 to 35, with a mean of 23.83 (SD=6.5). The theoretical range of the SWLS is 5-35, with a mean of 15.

Sample Characteristics

Respondents were divided into two groups based on scores on the SOGS. Group one consisted of individuals whose scores were equal to or greater than 4, indicating the probable presence of problem gambling. Group two consisted of individuals whose scores were less than 4. Group demographics are shown in Table 12.

Table 12

Group Demographics

	Non-Problem	Problem
Gender		
Men	81 (46%)	24 (70%)
Women	90 (54%)	10 (30%)
Age Range (20 to 90)		
Modal Age Range	50-59 (32%)	50-59 (31%)
Income Range ($20,000 to $100,000+)		
Modal Income Range	$20,000-$39,000	$40,000-$59,000
Education		
High School	87%	87%
University	50%	53%
Post-Graduate	20%	18%
College	40%	47%
Employment		
Employed	75%	68%
Retired	19%	12%
Disability	01%	09%
Students	03%	06%
Unemployed	02%	03%
Homemakers	00%	03%
Relationship Status		
Partnered	67%	74%
Single	18%	15%
Divorced/Separated	13%	15%
Widowed	02%	03%

All forms of gambling were represented as chosen favourite games by the non problem gambling group. The game favoured by the highest percentage of this group was playing the lottery (27.7%), followed by playing cards for money (21.9%), playing slot machines (13.5%), and gambling in casinos (12.3%).

Problem-gambling and gender were related χ^2 (1, N=205) = 6.29, $p < .01$. The problem gambling group had proportionally more men than women than would be expected. No differences were found on other demographic variables. The assumption of at least 5 entries for each cell for Chi-square evaluation could not be met for the favoured game variable. In the absence of a clear cut method of combining forms of gambling (i.e. playing cards plus gambling in casinos vs slot machines and gambling in casinos) the differences between groups was not tested.

Comparison of Means on Leisure, Gambling, and SEM Variables by Groups Divided by Problem Gambling.

The non-problem gambling group was much larger (N=171) than the problem gambling group (N=34). Levene's test statistic revealed heterogeneity of group variance for the identified gambling motivation sub-scale and the global self-determination index. In both cases the larger variance was in the smaller group, resulting in a liberal t test (Stevens, 1996, p. 249). Alpha level for these two variables was set to .01 to compensate for the liberal t test. T tests were performed on the five gambling motivations, leisure motivations, gambling self-determination indices, the global self-determination index, leisure self-determination indices,

gambling involvement, positive leisure consequences, and psychological functioning.

Individuals with gambling problems reported lower global self-determination. They scored lower on the high self-determination and higher on the low self-determination for leisure indices. These results suggest that problem gamblers are less self-determined globally and contextually. Problem gamblers endorsed all forms of gambling motivation more strongly than non-problem gamblers, as well as leisure amotivation. Reflecting the differences on sub-scales, individuals with problem gambling scored higher on both low and high self-determination gambling indices. They also reported greater involvement which suggests that involvement may be implicated in the development of problem gambling. Problem gamblers also reported poorer psychological functioning. No differences were found on positive leisure consequences. Tables 13, 14, and 15 display the results of these t tests. Transformed means of the introjected gambling motivation sub-scale and leisure amotivation sub-scale on which the comparisons were made were reconverted to the original scale and these anti-transformed means are shown in the tables for clarity.

Table 13

Comparison of Means of Leisure Motivation Reported by Groups Divided by Problem Gambling

Variable	NON-PROB (N=171) Mean	PROBLEM (N=34) Mean	t-Value	Probability
LIN	4.76 (1.09)	4.44 (.98)	-1.62 (df=203)	.106
LIDEN	4.68 (1.49)	4.35 (1.25)	-1.22 (df=203)	.225
LINTR	3.81 (1.34)	3.93 (1.23)	.46 (df=203)	.645
LEXT	2.50 (1.27)	3.02 (1.13)	2.23 (df=203)	.027
LAM	1.45 (1.02)	2.14 (1.15)	2.95 (df=203)	.004

Note. Non-Prob=SOGS<4, Prob=SOGS>3
LIN=Intrinsic Leisure Motivation, LIDEN=Extrinsic Leisure Motivation by Identified Regulation, LINTR=Extrinsic Leisure Motivation by Introjected Regulation, LEXT=Extrinsic Leisure Motivation by External Regulation, LAM=Leisure Amotivation
Numbers in parenthesis are standard deviations.

Table 14

Comparison of Means of Gambling Motivation Reported by Groups Divided by Problem Gambling

Variable	NON-PROB (N=171) Mean	PROBLEM (N=34) Mean	t-Value	Probability
GAMIN	2.25 (1.28)	4.33 (1.26)	.864 (df=203)	.000
GAMID	2.00 (1.29)	4.05 (1.84)	.785 (df=203)	.000
GAMINT	1.19 (.79)	2.27 (1.34)	-9.99 (df=203)	.000
GAMEXT	2.55 (1.78)	3.74 (1.62)	3.60 (df=203)	.000
GAMAM	1.70 (1.07)	3.38 (1.33)	7.99 (df=203)	.000

Note. Non-Prob=SOGS<4, Prob=SOGS>3
GAMIN=Intrinsic Gambling Motivation, GAMID=Extrinsic Gambling Motivation by Identified Regulation, GAMINT=Extrinsic Gambling Motivation by Introjected Regulation, GAMEXT=Extrinsic Gambling Motivation by External Regulation, GAMAM=Gambling Amotivation
Numbers in parenthesis are standard deviations.

Table 15

Comparison of Means of High and Low Global, Leisure, and Gambling Self-Determination, Leisure Consequences, Gambling Involvement, and Psychological Functioning Reported by Groups Divided by Problem Gambling

Variable	NON-PROB (N=171) Mean	PROBLEM (N=34) Mean	t-Value	Probability
GSDI	10.70 (7.04)	6.40 (6.40)	-3.40 (df=203)	.001
HIGAMSDI	2.12 (1.14)	4.19 (1.30)	9.38 (df=203)	.000
LOGAMSDI	2.08 (.89)	3.79 (1.09)	9.78 (df=203)	.000
HILSDI	4.72 (1.23)	4.39 (1.05)	-1.46 (df=203)	.145
LOLSDI	2.64 (.90)	3.03 (.75)	2.32 (df=203)	.021
LEISCONS	51.57 (8.40)	49.61 (9.98)	-1.20 (df=203)	.232
INVOLVE	5.09 (2.72)	8.00 (3.33)	5.45 (df=203)	.000
RSE	35.18 (4.62)	29.82 (6.02)	-5.85 (df=203)	.000
SWL	24.88 (5.99)	19.85 (6.24)	6.29 (df=203)	.000
CES-D	8.73 (7.68)	19.04 (12.85)	6.29 (df=203)	.000

Note. Non-Prob=SOGS<4, Prob=SOGS>3
GSDI=Global Self-Determination Index, HIGAMSD=High Gambling Self-Determination, LOGAMSD=Low Gambling Self-Determination, HILSD=High Leisure Self-Determination, LOLSD= Low Leisure Self-Determination, LEISCONS=Positive Leisure Consequences, Involve=Gambling Involvement, RSE=Rosenberg Self-Esteem Scale, SWL=Satisfaction with Life Scale, CES-D=Center for Epidemiologic Studies Depression Scale
Numbers in parenthesis are standard deviations.

Relationships between Self-Determination, Gambling Involvement, and Consequences

In order to determine whether gambling involvement is related to gambling problems and measures of psychological functioning, Involvement was correlated with the SOGS, RSE , SWL and CES-D. Gambling involvement was positively associated with gambling problems, but was not significantly related to self-esteem, satisfaction with life, or depressive symptomatology. The results are depicted in Table 16.

Table 16

Correlations between Gambling Involvement, Problem Gambling, and Psychological Functioning Measures

	SOGS	RSE	SWL	CES-D
INVOLVE	.43***	-.13	-.00	.03

Note: SOGS=South Oaks Gambling Screen; RSE =Rosenberg Self-Esteem Scale; SWL=Satisfaction with Life Scale; CES-D=Center for Epidemiologic Studies Depression Scale
***p<.001

In order to determine whether global self-determination was related to contextual motivations and their respective consequences, the global self-esteem index was correlated with high and low self-determination leisure and gambling indices, positive leisure consequences, and measures of psychological functioning. As expected, global self-determination was positively correlated with high leisure self-determination, self-esteem and satisfaction with life. It was negatively correlated with low leisure and gambling self-determination and depressive symptomatology. An unexpected finding was that global self-determination was not significantly correlated with high gambling self-determination. Global self-determination was also not significantly correlated with involvement. The results are shown in Tables 17 and 18.

Table 17

Correlations between Global Self-Determination and Leisure High and Low Self-Determination, Positive Leisure Consequences and Psychological Functioning Measures

	HILSDI	LOLSDI	LEISCONS	RSE	SWL	CES-D
GSDI	.38***	-.34***	.29***	.36***	.26***	-.24***

Note. GSDI=Global Self-Determination Index, HILSDI=High Leisure Self-Determination, LOLSDI=Low Leisure Self-Determination, LEISCONS=Positive Leisure Consequences, RSE=Rosenberg Self-Esteem Scale, SWL=Satisfaction with Life Scale, CES-D=Center for Epidemiologic Studies Depression Scale
***p<.000

Table 18

Correlations between Global Self-Determination and Gambling High and Low Self-Determination, Gambling Involvement, and Problem Gambling

	HIGAMSDI	LOGAMSDI	INVOLVE	SOGS
GSDI	-.07	-.18**	-.11	-.21**

Note. GSDI=Global Self-Determination Index, HIGAMSDI=High Gambling Self-Determination, LOGAMSDI=Low Gambling Self-Determination, INVOLVE=Gambling Involvement, SOGS=South Oaks Gambling Screen
**p<.01 ***p<.000

Confirmatory Factor Analyses

CFA procedures were used to perform preliminary analyses on the Leisure and Gambling Motivation Scales. The Global Motivation Scale has previously been shown to have good factorial structure (Guay et al., 1996), therefore validity was not re-tested in this study.

Confirmatory Factor Analysis of the Leisure Motivation Scale. The hypothesized model was a five-factor model, corresponding to the five sub-scales of the reduced Leisure Motivation Scale. The three items of each sub-scale were hypothesized to load significantly on their target factors, and not on other factors. The factors were hypothesized to be correlated based on Self-Determination Theory. Error variances of the items were hypothesized to be unique, and uncorrelated.

Results of CFA of the initially hypothesized model of the Leisure Motivation Scale

revealed that all parameter estimates were reasonable and statistically significant (CFI = .90, RMSEA = .092, PCFI = .52), indicating that the initially hypothesized model as a whole was an acceptable fit for the data.

In order to identify areas of misfit in the model the modification indices provided by the program were examined. The top three modification indices involve freeing an indicator to load on another latent construct. Allowing these variables to cross-load did not make theoretical sense. There were no further outstanding values suggestive of model misfit. No changes were made to the initial model. The model is shown in Figure 5.

Confirmatory Factor Analysis of the Gambling Motivation Scale. The hypothesized model was a five-factor model, corresponding to the five subs-scales of the reduced Gambling Motivation Scale. The three items of each sub-scale were hypothesized to load significantly on their target factors, and not on other factors. The factors were hypothesized to be correlated based on Self-Determination Theory. Error variances of the items were hypothesized to be unique, and uncorrelated.

Results of CFA of the initially hypothesized model of the Gambling Motivation Scale revealed that all parameter estimates were reasonable and statistically significant, (CFI = .93, RMSEA = .095, PCFI = .52, indicating that the initially hypothesized model as a whole is a moderate fit for the data.

In order to identify areas of misfit in the model the modification indices provided by the program were examined. The Maximum Modification Index indicated a cross-loading of the intrinsic motivation for stimulation indicator on the identified motivation

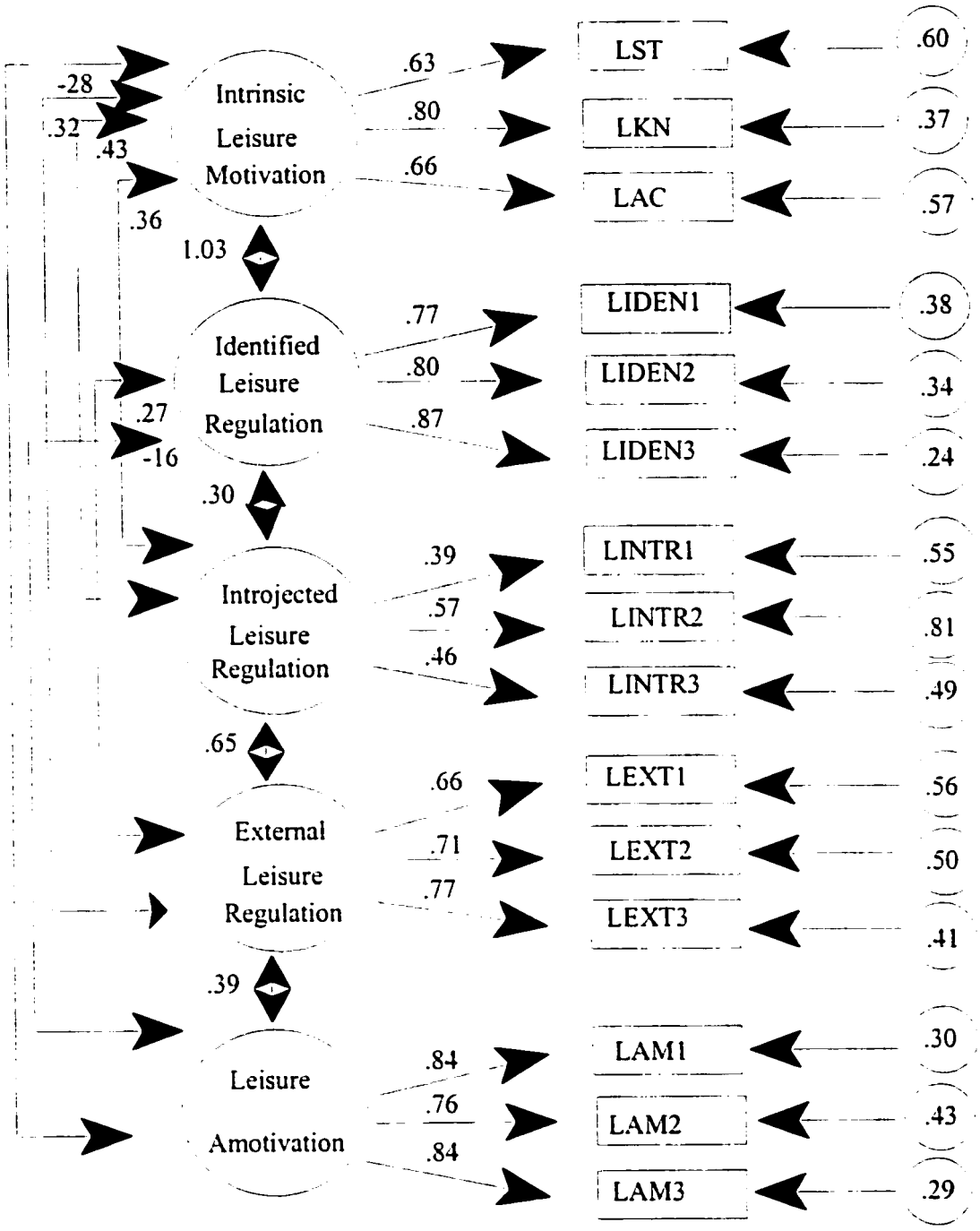


Figure 5. CFA of Leisure Motivation Scale. All parameters are significant at .001 level.
Note: LST=Intrinsic Leisure Motivation for Stimulation; LKN=Intrinsic Leisure Motivation for Knowledge; LAC=Intrinsic Leisure Motivation for Accomplishment
LIDEN=Identified Leisure Regulation; LINTR=Introjected Leisure Regulation; LEXT=External Leisure Regulation; LLAM=Leisure Amotivation

factor. Allowing this variable to cross-load on this factor did not make theoretical sense. The next largest modification index was for a correlated error between the intrinsic motivation to know and to accomplish indicators. Because these variables both load on the same factor measuring intrinsic motivation, it is plausible that their errors are correlated. However, this correlated error was not found in the previous CFA of the Gambling Motivation Scale, and it was considered to be sample specific. There were no further outstanding values suggestive of model misfit. No further consideration was given to the inclusion of additional parameters. The model is shown in Figure 6.

The Simplex Pattern

Correlations between sub-scales of the Leisure Motivation Scale replicated the simplex pattern previously found and are shown in Table 19. In addition, the pattern of correlations between leisure sub-scales and positive leisure consequences, depicted in Table 20, shows the descending pattern of correlations from most self-determined reasons for engaging in leisure activities to amotivation. These results indicate that respondents in this study (including individuals who gamble) respond to the Leisure Motivation Scale in a similar fashion to other groups previously included in research applying the Theory of Self-Determination to the leisure domain.

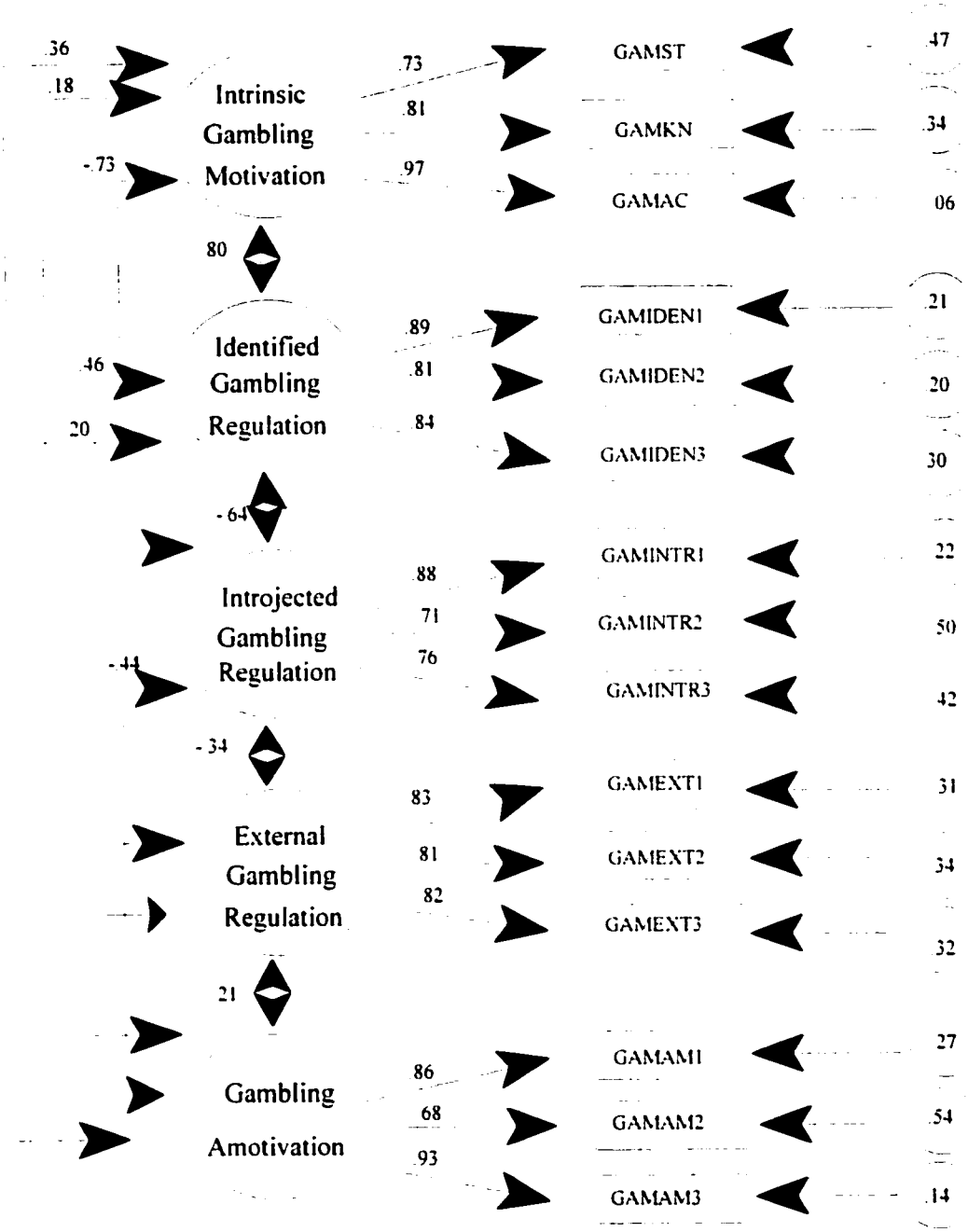


Figure 6. CFA of Gambling Motivation Scale. All parameters are significant at .01 level. Note: GAMST=Intrinsic Gambling Motivation for Stimulation; GAMKN=Intrinsic Gambling Motivation for Knowledge; GAMAC=Intrinsic Gambling Motivation for Accomplishment; GAMIDEN=Identified Gambling Regulation; GAMINTR=Introjected Gambling Regulation; GAMEXT=External Gambling Regulation; GAMAM=Gambling Amotivation

Table 19

Correlations between Leisure Motivation Sub-scales

Sub-scale	LIN	LIDEN	LINTR	LEXT	LAM
		Respondents (n =206)			
LIN	1.00	.80***	.34***	.26***	-.22***
LIDEN		1.00	.23***	.24***	-.11
LINTR			1.00	.51***	.07
LEXT				1.00	.31***
LAM					1.00

Note. LIN=Intrinsic Leisure Motivation for Leisure, LIDEN=Extrinsic Leisure Motivation by Identified Regulation, LINTR=Extrinsic Leisure Motivation by Introjected Regulation, LEXT=Extrinsic Leisure Motivation by Leisure Regulation, LAM=Leisure Amotivation
*p<.05, **p<.01, ***p<.001

Table 20

Correlations between Leisure Motivation Sub-scales and Positive Leisure Consequences

Variable	LIN	LIDEN	LINTR	LEXT	LAM
		Respondents (n=206)			
LEISCONS	.54***	.42***	.35***	.05	-.33***

Note. LIN=Intrinsic Leisure Motivation, LIDEN=Extrinsic Leisure Motivation by Identified Regulation, LINTR=Extrinsic Leisure Motivation by Introjected Regulation, LEXT=Extrinsic Leisure Motivation by External Regulation, LAM=Leisure Amotivation, LEISCONS=Positive Leisure Consequences
*p<.05, **p<.01, ***p<.001

Correlations between gambling motivation sub-scales resulted in a pattern similar to that found in Study 1. Again it differed from the pattern found by Chantal et al. (1994). A decreasing correlation of the intrinsic sub-scale with identified and introjected sub-scales was not apparent and the amotivation sub-scale was more highly correlated with the intrinsic, identified, and introjected sub-scales than with the external sub-scale. Correlations of sub-scales with involvement differed from Chantal et al.'s (1994) pattern with intention to pursue, in that both introjected and amotivation sub-scales were significantly related to involvement in this study. The pattern found between sub-scales and negative consequences also differed from previous findings. In Chantal et al.'s (1994) study intrinsic and identified sub-scales were less highly correlated with compulsion than

were less self-determined forms. In this research the ascending pattern was not found with the measure of problem gambling. Correlations between gambling sub-scales, and with gambling involvement, and problem gambling are shown in Table 21 and 22.

Table 21

Correlations between Gambling Motivation Sub-scales

Sub-scale	GAMIN	GAMID	GAMINT	GAMEXT	GAMAM
			Respondents (n=205)		
GAMIN	1.00	.65***	.67***	.19**	.32***
GAMID		1.00	.55***	.17**	.41***
GAMINT			1.00	.31***	.35***
GAMEXT				1.00	.21***
GAMAM					1.00

Note. GAMIN=Intrinsic Gambling Motivation, GAMID=Extrinsic Gambling Motivation by Identified Regulation, GAMINT=Extrinsic Gambling Motivation by Introjected Regulation, GAMEXT=External Gambling Regulation, GAMAM=Gambling Amotivation
*p>.05, ** p<.01, ***p<001

Table 22

Correlations between Involvement, Problem Gambling, and Motivation for Gambling

	GAMIN	GAMID	GAMINT	GAMEXT	GAMAM
			Respondents (n=205)		
INVOLVE	.50***	.34***	.38***	.10	.25***
SOGS	.54***	.54***	.60***	.30***	.53***

Note. GAMIN=Intrinsic Gambling Motivation, GAMID=Extrinsic Gambling Motivation by Identified Regulation, GAMINT=Extrinsic Gambling Motivation by Introjected Regulation, GAMEXT=Extrinsic Gambling Motivation by Gambling Regulation, GAMAM=Gambling Amotivation, INVOLVE=Gambling Involvement, SOGS=Problem Gambling
*p<.05, **p<.01, ***p<.001

The different patterns of correlations with gambling sub-scales found in this research than previous research may be the result of intentional inclusion of problem gamblers. It is unknown whether Chantal et al.'s (1994) sample included problem gamblers because no assessment was made. If these authors' proposal that a compulsive gambler who keeps on betting with no real purpose and little sense of meaning is displaying amotivation is accurate, the amotivation sub-scale in research including problem gamblers should be highly correlated with the problem gambling measure. In addition, it may be more highly correlated with involvement and possibly the more self-determined

forms of gambling than the Self-Determination Theory would predict. In order to test this supposition, correlational analyses between gambling motivation sub-scales and between sub-scales and involvement and problem gambling measures were repeated separately for the problem and non-problem gambling groups and are shown in Tables 23, 24, 25, and 26.

Table 23

Correlations between Gambling Motivation Sub-scales for Non-Problem Gambling Group

Sub-scale	GAMIN	GAMID	GAMINT	GAMEXT	GAMAM
			Respondents (n= 171)		
GAMIN	1.00	.59***	.57***	.03	.08
GAMID		1.00	.49***	.05	.17*
GAMINT			1.00	.18**	.13
GAMEXT				1.00	.11
GAMAM					1.00

Note. GAMIN=Intrinsic Gambling Motivation, GAMID=Extrinsic Gambling Motivation by Identified Regulation, GAMINT=Extrinsic Gambling Motivation by Introjected Regulation, GAMEXT=Extrinsic Gambling Motivation by External Regulation, GAMAM=Gambling Amotivation
*p<.05, ** p<.01 ***p<001

Table 24

Correlations between Gambling Motivation Sub-scales for Problem Gambling Group

Sub-scale	GAMIN	GAMID	GAMINT	GAMEXT	GAMAM
			Respondents (n= 34)		
GAMIN	1.00	.38*	.40*	.30	.14
GAMID		1.00	.04	.11	.40*
GAMINT			1.00	.35*	.14
GAMEXT				1.00	.12
GAMAM					1.00

Note. GAMIN=Intrinsic Gambling Motivation, GAMID=Extrinsic Gambling Motivation by Identified Regulation, GAMINT=Extrinsic Gambling Motivation by Introjected Regulation, GAMEXT=Extrinsic Gambling Motivation by External Regulation, GAMAM=Gambling Amotivation
* $p<.05$, ** $p<.01$, ***$p<001$

Table 25

Correlations between Involvement, and Problem Gambling, and Motivation for Gambling for the Non Problem Gambling Group

	GAMIN	GAMID	GAMINT	GAMEXT	GAMAM
			Respondents (n=171)		
INVOLVE	.43***	.27***	.25***	-.04	.15*
SOGS	.35***	.26***	.25***	-.03	.19**

Note. GAMIN=Intrinsic Gambling Motivation, GAMID=Extrinsic Gambling Motivation by Identified Regulation, GAMINT=Extrinsic Gambling Motivation by Introjected Regulation, GAMEXT=Extrinsic Gambling Motivation by External Regulation, GAMAM=Gambling Amotivation, INVOLVE=Gambling Involvement, SOGS=Problem Gambling,
*p<.05, **p<.01, ***p<.001

Table 26

Correlations between Involvement, Problem Gambling, and Motivation for Gambling for the Problem Gambling Group

	GAMIN	GAMID	GAMINT	GAMEXT	GAMAM
			Respondents (n=34)		
INVOLVE	.21	.01	.13	.34*	-.10*
SOGS	.30	.43**	.41*	.59***	.40*

Note. GAMIN=Intrinsic Gambling Motivation, GAMID=Extrinsic Gambling Motivation by Identified Regulation, GAMINT=Extrinsic Gambling Motivation by Introjected Regulation, GAMEXT=Extrinsic Gambling Motivation by External Regulation, GAMAM=Gambling Amotivation, INVOLVE=Gambling Involvement, SOGS=Problem Gambling,
*p<.05, **p<.01, ***p<.001

Results indicate that the simplex patterns between sub-scales and with involvement and the problem gambling measure are more closely approximated, but still not flawless when individuals with problem gambling are separated from those with non-problem gambling for the analyses. The strong correlation between the identified and amotivation sub-scales was evident in all analyses suggesting that this association between the more self-determined identified regulation sub-scale and least self-determined amotivation sub-scale is not unique in a sample of individuals who endorse problem

gambling behaviours. The identified sub-scale items in the Gambling Motivation Scale represent gambling to relax, to relieve tension, and to distract one-self from concerns. It may be that some individuals interpret these items as a non self-determined "escape" from problems, rather than a self-determined choice for pleasure.

For the non problem gambling group the more self-determined reasons for gambling were more highly correlated with involvement than less-self determined reasons, as would be predicted by the Self-Determination Theory. They were also more highly correlated with the problem gambling measure. The only reason for gambling not significantly related to problems was the extrinsic regulation sub-scale. It should be pointed out that problem gambling scores for this group were below the cut-off score that is considered to represent pervasive difficulties regulating gambling. The problem gambling score for this group may reflect rare lapses in control over time and money spent gambling that would not be unusual or reflective of systematic problems with involvement in gambling. Alternatively, it may represent an association between self-determined reasons for gambling, involvement, and repetitive but limited gambling problems.

The only Gambling Motivation sub-scale related to involvement for the problem gambling group was the extrinsic regulation sub-scale which represents gambling for the external reward of money. This sub-scale was also most highly correlated with problem gambling scores. This may mean that the more one gambles to obtain money, the more gambling problems one develops, as would be predicted by Self-Determination Theory. Alternatively, it may mean that the more gambling problems one has, the more one

gambles to get money. Identified, introjected, and amotivation sub-scales were also significantly related to the problem gambling measure but not to involvement. The associations between the less self-determined reasons for gambling and gambling problems would be expected according to SDT. In addition, the correlations between non self-determined forms of gambling and problem gambling, in the absence of association with the measure of frequency, suggest that these forms of regulation require little involvement for the associations. The association between the more self-determined identified sub-scale and problem gambling may reflect ambiguity in interpretation of the statements.

The significant correlations between amotivation and gambling problems found in the problem gambling group provides support for Chantal et al.'s proposal that gamblers who endorse gambling despite questioning the benefits or whether the activity is good for them may be expressing feelings of compulsion. If this assertion is correct, the association of amotivation with involvement and problem gambling for the non-problem group may indicate a connection between involvement and the development of gambling problems.

Structural Equation Modelling

There was one exogenous factor in the structural model (Global Self-Determination) represented by three indicator variables. There were 8 endogenous factors (High Leisure Self-Determination, Low Leisure Self-Determination, High Gambling Self-Determination, Low Gambling Self-Determination, Positive Leisure Consequences,

Gambling Involvement, Problem Gambling, and Psychological Functioning) comprised of 25 indicator variables, along with their associated error terms. In total, 28 indicators were used to measure the hypothesized structural model.

As can be seen in Figure 4, direct paths, impacting on psychological functioning were hypothesized as follows: Global Self-Determination would be positively associated with High Gambling and Leisure Self-Determination and negatively associated with Low Gambling and leisure self-determination. High Leisure Self-Determination would be positively, and Low Leisure Self-Determination would be negatively associated with Positive Leisure Consequences. Positive Leisure Consequences would be positively associated with Psychological Functioning. High Gambling Self-Determination would be associated with Gambling Involvement and Low Gambling Self-Determination with Problem Gambling. Gambling Involvement would be positively associated with Psychological Functioning and Problem Gambling. Problem Gambling would be negatively associated with Psychological Functioning.

Completely standardized structural and measurement coefficients are displayed in Figure 7. All indicator variables loaded significantly on their respective constructs. All hypothesized paths had significant coefficients with the exception of the direct effect of low self-determination for leisure on positive leisure consequences. One notable difference in the obtained results from the hypothesized model was the direction of the relationship between Global Self-Determination and High Gambling Self-Determination. A positive association was hypothesized and a negative relationship was found.

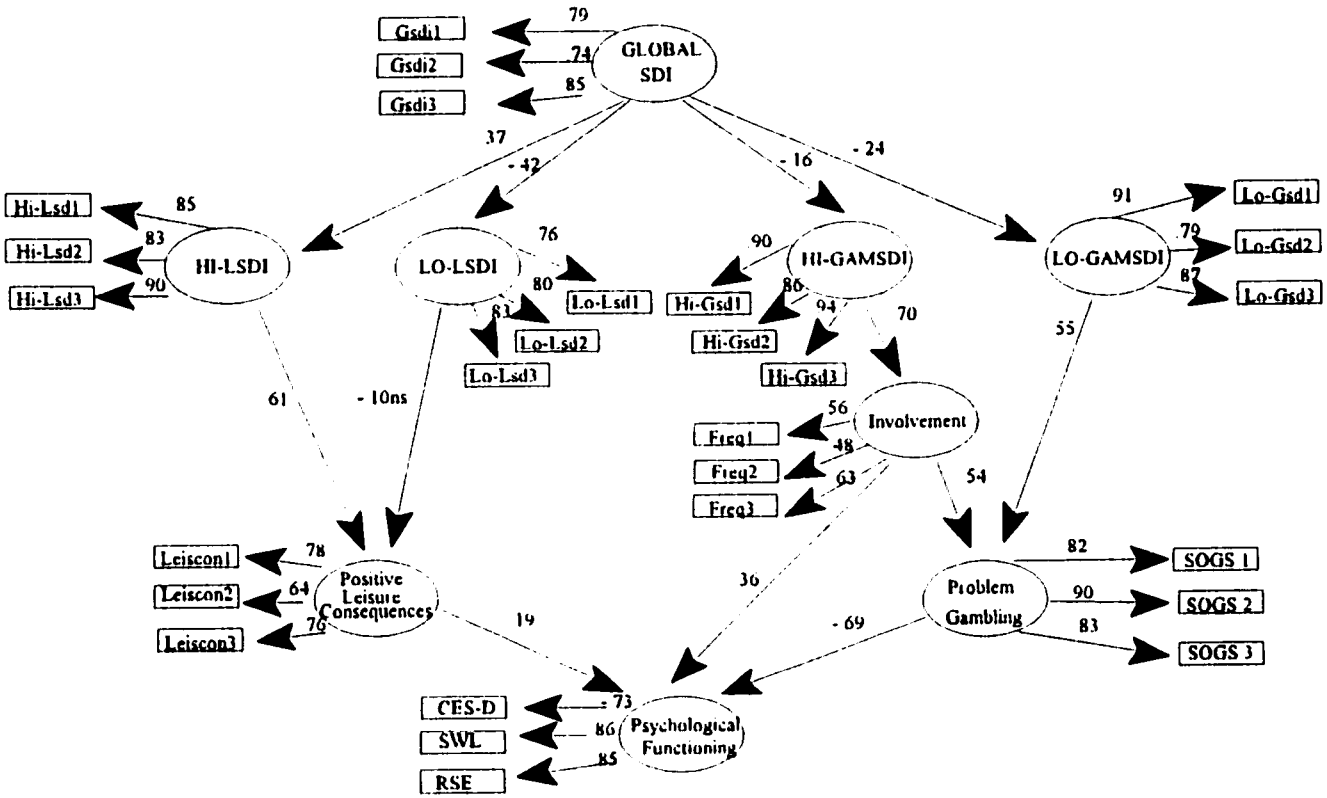


Figure 7. Initial Hierarchical Model of Motivation for Leisure and Gambling Activities

Note: GSDI=Global Self-Determination Index; LOLSDI=Low Leisure Self-Determination Index; HILSDI=High Leisure Self-Determination Index; LOGAMSDI=Low Gambling Self-Determination Index; HIGAMSDI=High Gambling Self-Determination Index

Goodness of fit statistics indicated that the hypothesized model was a reasonable representation of the data ($\chi^2_{(313)}$=674.65, p.001, ,CFI = .89, RMSEA = .072, PCFI = 79). The CFI was just lower than the rule of thumb lower limit cut point of acceptable fit (Byrne, 1994) indicating areas of misfit in the model. The RMSEA value was well within the recommended range of acceptability, as was the PCFI.

Post Hoc Analyses

Structural Equation Modelling

Examination of the modification indices revealed improvement in model fit to be gained from the additional specification of two correlated errors. Taking into account the non-significance of the path between Low Leisure Self-Determination and Positive Leisure Consequences, the initially hypothesized model of problem gambling was respecified by eliminating this variable. Estimation of this model resulted in a slight erosion in model fit from $\chi^2_{(312)}$=674.65 to $\chi^2_{(313)}$=676.59. With deletion of parameters in a model such a change is to be expected, the important consideration of this change in model fit is that the χ^2 difference between the two models was not statistically significant (Byrne 1998, p. 247). Chi square change is distributed with degrees of freedom equal to the difference in degrees of freedom (Δ df) and can be tested statistically. As indicated in Table 27, χ^2 increased non-significantly and there were no other changes in goodness of fit statistics.

Table 27

Goodness of Fit Statistics for Competing Models of the Problem Gambling Structural Model

Competing Model	df	χ^2	Δdf	$\Delta \chi^2$	RMSEA	PCFI	CFI
Initial	312	674.65			.073	.79	.89
Model 2	313	676.59	1	+1.94	.073	.79	.89
Model 3 (Chosen)	311	666.57	1	10.02	.072	.79	.90

The largest modification index represented a path between High and Low Gambling Self-Determination constructs. This association was mirrored by the MI on the PSI matrix. It is to be expected that there will be some correlation between the two constructs because of the correlation between the adjacent sub-scales of identified and introjected motivation which load on the High and Low Self-Determination constructs respectively. However, including this path does not make theoretical sense in the model, and so the next largest MI was considered, the establishment of a path between Problem Gambling and High Gambling Self-Determination. The direction of this path, indicating that gambling problems lead to self-determined motivation for gambling does not conform to the theory being tested and was not included in the model. The next highest MI represented a path between Involvement and Low Gambling Self-Determination. Once again, the direction of this path is questionable. It may represent an association between high frequency gambling

and a sense of compulsion expressed as amotivation. However, this is a modification does not make theoretical sense according to Self-Determination Theory, therefore this respecification was not made. The next highest MI represented a path between High and Low Leisure Self-Determination. As in the case of the parameter between High and Low Gambling Self-Determination, this path is identified by the program as belonging in the model based on statistical criteria only, and is not substantively meaningful. This path was not incorporated.

The next highest MI represented a correlated error between LO-GAMSD1 and LO-GAMSD3. These indicators load on the same factor, Low Gambling Self-Determination, however this correlated error may be sample specific. This correlated error was not freed. The next highest MI was for a correlated error between FREQ2 and FREQ3. Once again, these variables load on the same factor, Involvement, suggesting that correlated error is plausible. Additionally, these indicators were created from one question on the SOGS and it is reasonable that the errors would be replicated in other samples. As can be seen in Table 27, freeing this error resulted in a significant change in χ^2. There were no further outstanding values suggestive of model misfit. No further consideration was given to the inclusion of additional parameters. The chosen model is illustrated in Figure 8.

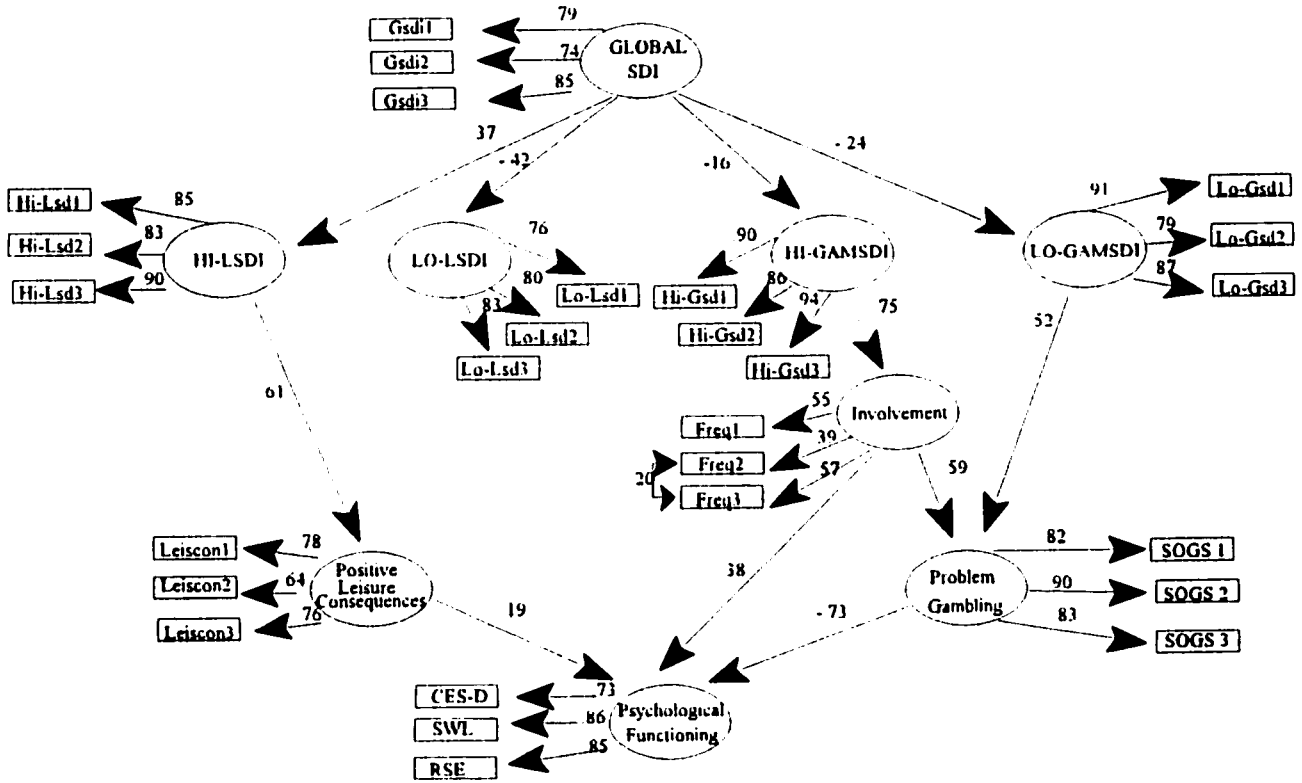


Figure 8. Chosen Hierarchical Model of Motivation for Leisure and Gambling Activities
Note: GSDI=Global Self-determination Index; LOLSDI=Low Leisure Self-determination Index; HILSDI=High Leisure Self-determination Index; LOGAMSDI=Low Gambling Self-determination Index; HIGAMSDI=High Gambling Self-determination Index

Testing for Moderating Effects of Global Self-Determination

In order to investigate the possibility that the relationship between gambling involvement and gambling problems (SOGS) varies depending on an individual's level of global self-determination (GSDI) moderating effects were tested using multiple regression techniques. To eliminate the possibility of multicollinearity effects between the predictor (involvement), the moderator (GSDI), and the interaction term (INVOLVEMENTxGSDI), the independent variable and the moderator were centred before testing the significance of the interaction term. The results of the regression analysis reveals that problem gambling is significantly affected by GSDI, $t(201) = -2.77$, $p<.05$ and involvement, $t(201) = 6.6$, $p<.00$ but there is an interaction of these two predictors $t(201) = -2.563$, $p<.01$. The relationship between Involvement and Problem Gambling differs depending on the level of Global Self-Determination. To tease out the interaction of these variables two regression lines were computed, one representing the relationship for individuals with high global self-determination (one standard deviation above the mean) and one for individuals with low self-determination (one standard deviation below the mean). The standard deviation of Global Self-Determination was 6.907. This was inserted into the regression equation produced by the regression analysis. The resulting regression equation represented the simple regression line resulting from regressing Involvement on SOGS at a high level of global self-determination. The same procedure was followed using -6.907 to obtain the regression line for a low level of self-determination. To produce a graphical presentation of these regression lines, the lowest, mean, and highest values for involvement were selected

and entered into the regression equations to derive the predicted values for problem gambling. The graph is shown in Figure 9. In order to test whether the slopes were significant a variable representing high GSDI was created by subtracting the standard deviation from the observed scores. This variable was then used to create a new interaction term with Involvement. Regression predicting Problem Gambling from Involvement and the new high GSDI value, and their interaction revealed that the slope for high level of self-determination was significant $t(201)=-2.563$, $p = .01$. Following the same procedure for low self-determination revealed a significant slope. Overall these analyses indicate that level of global self-determination is a significant moderator of the relationship between gambling involvement and gambling problems. More specifically for the same level of involvement in gambling activities individuals with high global self-determination experience fewer gambling problems than individuals with low global self-determination.

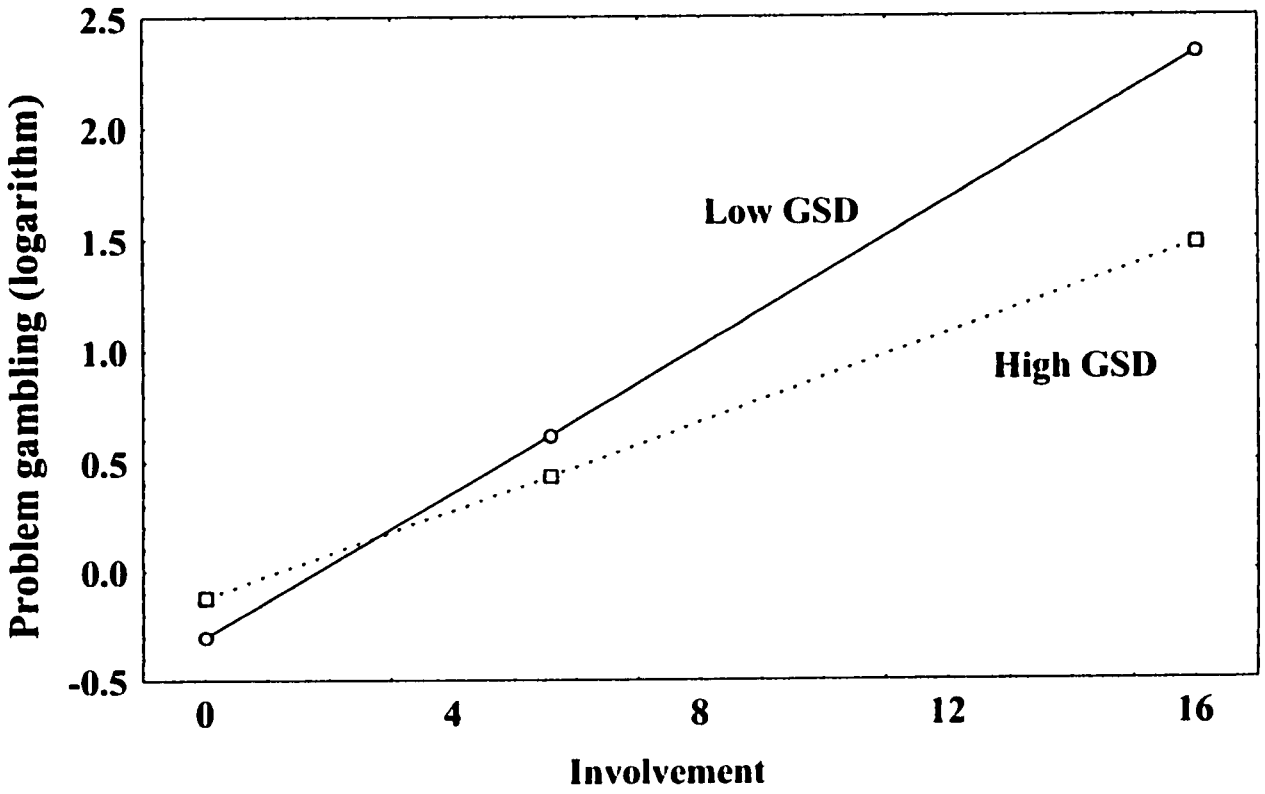


Figure 9. Relationship between gambling involvement and problem gambling as a function of Global Self-determination.

Note. GSD=Global Self-determination

Independence of Domains

In order to establish the independence of the domains of leisure and gambling, the SEM program was run once again with the High and Low Gambling and Leisure Self-Determination indices substituted for one another. That is to say, High and Low Gambling Self-Determination constructs predicted Positive Leisure Consequences, and High and Low Leisure Self-Determination construct predicted gambling involvement and problems. It was proposed that if these constructs are not interchangeable, and therefore distinct, the model would not be a good fit for the data.

Estimation of this model resulted in a significant $\chi^2_{(312)} = 871.78$ and a CFI value of .84, indicating a poor fit of the revised model to the data. Paths between High and Low Gambling Self-Determination and Positive Leisure Consequences were non-significant. The same was true for paths between High and Low Leisure Self-Determination and Involvement and Problem Gambling. The leisure and gambling constructs are considered to measure two separate and distinct domains. The model substituting the domains is shown in Figure 10.

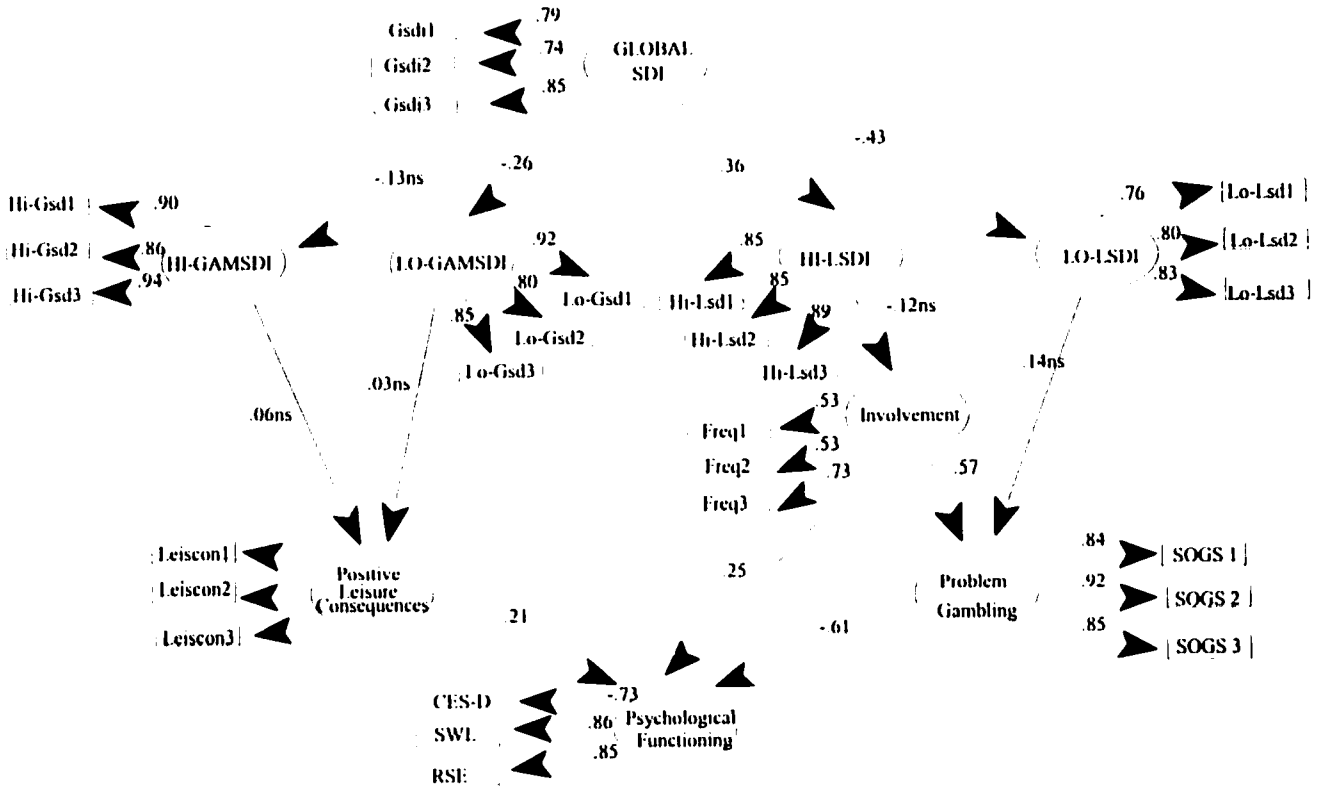


Figure 10. Independence Model

Note: GSDI=Global Self-determination Index; LOLSDI=Low Leisure Self-determination Index; HILSDI=High Leisure Self-determination Index; LOGAMSDI=Low Gambling Self-determination Index; HIGAMSDI=High Gambling Self-determination Index

Discussion

Purpose of the Study

The purpose of this research was to test the application of Deci and Ryan's (1990) Self-Determination Theory to a potentially problematic behaviour, namely gambling, and investigate the relationship between gambling motivation and consequences. Past research based on the Theory of Self-Determination has been predominantly focussed on adaptive behaviours. In order to evaluate the appropriateness of extending the tenets of this theory to a potentially problematic behaviour and its consequences, motivation for leisure activities was also measured and a motivation model of gambling was tested using the hierarchical model of motivation proposed by Vallerand (1997).

Leisure activity was selected as the other domain because it was considered to be a behaviour that is related to but distinct from gambling, and because past research (Pelletier et al., 1995, 1996) indicated that the scale used to measure leisure motivation is a reliable instrument to assess motivational orientation as defined by Self-Determination Theory. Incorporation of this domain into the model allowed inclusion of variables that have been tested with a general population and scales that have been developed to test propositions from Self-Determination Theory in life domains that are considered non-pathological. Inclusion of the measure of global motivation and motivation for gambling activities allowed examination of the relationship between the level of self-determination in people's lives and their reported level of self-determination for gambling activities. By measuring

both motivations it was possible to examine an inconsistency that could follow from the application of Self-Determination Theory to potentially problematic behaviours. First, as the global and gambling levels of self-determination increase, do people indicate a higher or lower level of involvement in gambling activities? Second, as the level of involvement increases, do people indicate that they experience more or less gambling problems and higher or lower levels of psychological functioning? A high level of global self-determination should not necessarily be associated with more involvement in gambling activities because people who are self-determined in their lives should be less inclined to approach these activities (for whatever the reasons) because they may be considered as less fulfilling for their basic needs for autonomy and competence or they should consider these activities as recreational activities and their involvement should decrease as the perception of potential problems with these activities increase.

According to Vallerand's (1997) theoretical model specific domains predict specific consequences, therefore, leisure motivation should predict leisure consequences and gambling motivation should predict gambling consequences. Linking the two domains hierarchically by global motivation allowed for verification that Vallerand's (1997) postulate that global motivation is channelled down to contextual motivation based on patterns of results previously found with non-problem behaviours could be extended to problem behaviours. This arrangement also provided a potential assessment of the Gambling Motivation Scale's representation of self-determination. Inclusion of the two behavioural models based on Self-Determination Theory provided a means of comparison

of the relationship between adaptive and potentially problematic behaviours and their consequences. In addition it controlled for the possibility that a sample of people who gamble are different from samples on which previous research has been conducted by incorporating a domain that had already been explored.

It was expected that global motivation would be channelled to domain specific motivation. Individuals who were more self-determined globally would participate in leisure activities for autonomous reasons, which would be associated with positive leisure consequences and good psychological functioning. Individuals who were less self-determined globally would participate in leisure activities for controlled reasons, which would be negatively associated with positive leisure consequences. Similarly, it was expected that individuals who were more globally self-determined would participate in gambling for autonomous reasons, which would be associated with gambling frequency. This involvement would either be associated with gambling problems or good psychological functioning. Those who were less globally self-determined were expected to gamble for controlled reasons, which would lead to gambling problems and poor psychological functioning.

The first step was to explore relationships between motivation for gambling, gambling involvement, problem gambling, and possible psychological consequences. In addition the integrity of the measurements representing these constructs required evaluation. These results will be reviewed briefly. The second step was to test a model postulating causal relations between these constructs. Results relating to the hypotheses in

the second step will be summarized and integrated. Also, these analyses involved testing the moderating role that global self-determination could play in the explanation of the relationship between gambling involvment and problem gambling. The theoretical questions addressed in this research will be reviewed followed by an integration of these findings with past literature. Then, the implications of these findings will be discussed. Finally, limitations of the present study and future research directions will be considered.

Summary of Results

Psychometric Properties of the Scales

CFA procedures replicated the structure of the Leisure Motivation Scale. The reproduction of the simplex pattern of correlation of sub-scales of the Leisure Motivation Scale, and with the relevant construct of Positive Leisure Consequences, supported the continuum of self-determination proposed by the Self-Determination Theory for adaptive behaviours. The higher correlations found between more self-determined than less self-determined motivations for leisure with positive leisure consequences supported tenets of Self-Determination Theory that higher levels of self-determination should be associated with more positive consequences. These findings supported the model paths and positive associations between High Leisure Self-determination and Positive Leisure Consequences and Psychological Functioning.

CFA procedures also replicated the structure of the Gambling Motivation Scale. However, the pattern of correlations between sub-scales of the Gambling Motivation Scale and with gambling involvement differed from a simplex pattern. The amotivation sub-scale

was more strongly correlated with the more self-determined sub-scales and with involvement than would be expected according to the continuum of self-determination proposed by Self-Determination Theory. These findings raise some concern about the construct validity of the Gambling Motivation Scale. The negative correlation between the low gambling self-determination construct, which was a combination of the three less self-determined sub-scales, and global self-determination supports that validity of this construct. The lack of correlation between high gambling self-determination and global self-determination suggests that the lack of continuum may be attributed to the operational definition of the intrinsic and identified sub-scales.

Separate analyses of the cases that met the criteria for problem gambling and those that did not resulted in a pattern of correlations between sub-scales that approximated Chantal et al.'s (1994) simplex pattern providing some support for the view that reasons for gambling can be classified into categories corresponding to Deci and Ryan's (1990) types of motivation in a non-problem gambling sample. In addition, the pattern of correlation between sub-scales and involvement approximated the simplex pattern. However, there was still an unexpectedly high correlation between the identified sub-scale and the amotivation sub-scale, which once again points to a weakness in the construction of the scale. The change in the correlations between sub-scales and with related variables with the removal of the cases with high scores on problem gambling suggests that individuals who have developed problems with gambling respond differently to the Gambling Motivation Scale items than individuals who do not have problems. This finding raises questions about

the appropriateness of using this scale in a population that includes problem gamblers. These questions will be addressed in the section on future research.

Also, these findings suggest that the results of the SEM analysis of the model of problem gambling must be interpreted with caution. While there is some evidence that the Gambling Motivation Scale represents degrees of self-determination for gambling, it does not appear to support completely the continuum of self-determination proposed by Deci and Ryan (1990). In addition, individuals with gambling problems may interpret items differently than individuals without problems. Therefore, the meaningfulness of structural links in the model may be suspect because of construct validity weakness in the measurement model.

Self-Determination, Gambling Involvement and Problem Gambling

As expected, the relationship between self-determination, involvement in gambling, and problem gambling proved to be complex. For the sample as a whole the higher correlations between more self-determined than less self-determined motivations for gambling with gambling involvement substantiated the proposition that higher levels of self-determination should be associated with higher levels of involvement in the activity. When the sample was divided by scores on problem gambling different patterns emerged. For non-problem gamblers, whose scores on the SOGS represented occasional or limited problems, the same pattern was evident. However, for problem gamblers less self-determined reasons for gambling were more highly correlated with involvement and scores on the SOGS. Involvement was highly correlated with gambling problems, but not with

psychological functioning. This finding suggested that gambling involvement alone was not associated with poor psychological functioning, but only through the development of gambling problems.

SEM Analyses

The Proposed Model. The results of the SEM analysis of the model supported the hypothesis that global motivational orientation would be positively related to High Leisure Self-Determination and negatively related to Low Leisure Self-Determination. In other words, individuals who engaged in most activities for intrinsic reasons or because they accepted the value of the activity as personally important or meaningful engaged in leisure activities for the same reasons. Individuals who generally guided their behaviours by introjected and external regulation, or without a sense of objective participated in their leisure activities for similar purposes.

High Leisure Self-Determination was positively associated with Positive Leisure Consequences, supporting hypothesis II. Individuals who reported engaging in their leisure activities for pleasure or self-improvement reported experiencing more positive consequences in the form of positive emotions, a sense of freedom, absorption in the activity, and an absence of stress. The negative association between Low Leisure Self-Determination and Positive Leisure Consequences was not supported. There was no association between Low Leisure Self-Determination and Positive Leisure Consequences. Individuals who reported engaging in their leisure activities because they felt pressured to do so, wanted to create a good impression, or without a clear sense of purpose did not

ascribe to experiencing these positive consequences. Hypothesis III was supported with the finding that positive leisure consequences were associated with better psychological functioning in the form of more self-esteem, fewer depressive symptoms, and greater satisfaction with life in general.

The positive association between Global Self-Determination and High Gambling Self-Determination was not found. This association was significant, but negative. Individuals who reported being globally self-determined did not report gambling for intrinsic and identified reasons. The negative association between Global Self-Determination and Low Gambling Self-Determination was supported, and was higher than that between High Global Self-Determination and High Gambling Self-Determination. Individuals who reported being less self-determined reported gambling for external and introjected reasons or without knowing what they got out of the activity.

Consistent with hypothesis V High Gambling Self-Determination was positively associated with Gambling Involvement. Involvement was significantly related to both Problem Gambling and Psychological Functioning. Individuals who reported gambling for stimulation, to learn more about the game, or for a sense of accomplishment reported gambling frequently. For some, this frequency was associated with difficulties such as lack of control over gambling and feelings of guilt, debt, deception, or family or job disruption. These problems were negatively associated with Psychological Functioning. For others, gambling involvement was associated with good self-esteem, satisfaction with life, and an absence of depressive symptoms. As proposed Low Gambling Self-Determination was

directly and positively related to Problem Gambling. Those who gambled to impress others, to win money, or in the presence of doubts of what they were getting from the activity reported experiencing difficulties in the absence of high frequency gambling. Problem Gambling was negatively associated with Psychological Functioning, supporting hypothesis XII.

The positive associations of Gambling Involvement with both Psychological Functioning and Problem Gambling prompted the consideration of possible factors could be involved in determining which consequence a frequent gambler would experience. The negative correlation of global self-determination with problem gambling provided a clue. Results of regression analyses revealed Global Self-Determination to moderate the relationship between Gambling Involvement and Problem Gambling. Individuals with high global self-determination experienced fewer gambling problems than individuals with low global self-determination at the same level of involvement. A test of Global Self-Determination as a moderator of the relationship between Gambling Involvement and Psychological Functioning did not reach statistical significance.

Alternative SEM Analysis. When SEM analysis was conducted on a model wherein leisure motivation predicted gambling consequences, and gambling motivation predicted leisure consequences, paths between these constructs were non-significant and indices revealed a poor fit to the data. This finding provides support for the contention that the domains of leisure and gambling are distinct, although conceptually related. In addition, this independence of domains supports the tenet of the Vallerand Hierarchical Model

(1997) that consequences of behaviour are domain specific.

Convergence and Divergence with Past Literature

The results of this study extend the investigation by Chantal et al. (1994, 1995) and Chantal and Vallerand (1996) to the relationship between self-determination for gambling and gambling behaviour. Chantal et al. (1994) suggested that future research might benefit from a recruitment of a variety of gambling venues and the use of more advanced confirmatory statistical analysis, which this research employs. These authors found that the less self-determined reasons for gambling were more strongly correlated with compulsion than were more self-determined reasons, but that the more self-determined reasons were also significantly correlated with compulsion. In addition, these authors found that individuals who were categorized as having high self-determination for gambling reported a higher degree of involvement than did those who were categorized as having low self-determination for the activity. The results of this study converge with Chantal et al.'s (1995) findings and provide a potential answer to the question that their findings raised: Would high-SDMP or low-SDMP gamblers be expected to be more likely to have problems regulating their gambling? It would appear that both groups are at risk and that low-SDMP gamblers are more likely to develop problems. For the high-SDMP gambler the development of problems is related to the frequency of play and moderated by the level of global self-determination. For the low-SDMP gambler the pathway to problems is a direct route.

Significant paths on the leisure side of the model between higher self-determined

motivations for leisure and positive leisure consequences and mental health mirrored the results of previous research using Self-Determination Theory in the leisure domain. More self-determined reasons for engaging in leisure activities have been found to be more highly correlated with positive leisure consequences (Pelletier et al., 1996) and good psychological functioning (Pelletier et al. (1995). This convergence with previous findings provides support for the Self-Determination Theory as well as providing evidence that the sample in this study is comparable to previous samples.

The results of the assessment of the hierarchical model were similar to those of Chantal et al. (1995). The model in this study differed in that contextual motivation for one domain considered to be functional and one domain considered to be problematic were included. Each domain was divided into autonomous and controlled motivation rather than one motivational index, and the problem gambling side included a measure of involvement as well as consequences.

The leisure side of the model replicated the association between global self-determination and high contextual self-determination, and positive domain specific consequences. The negative association between global self-determination and low self-determination for leisure provided the mirror image of the positive association. Results of the gambling side of the model departed from the pattern previously found with functional activities. A negative association between global self-determination and both high and low contextual self-determination was found. This deviation may suggest that gambling, as a potentially problematic behaviour, is inherently different from a predominantly functional

behaviour. If global self-determination is not positively related to any reasons for engaging in the activity, it may be that the activity does not lend itself to self-determined reasons for participation. Alternatively, the Gambling Motivation Scale items did not capture more self-determined reasons for gambling. The association between more self-determined reasons for engaging in an activity and good psychological functioning, this time through an involvement construct, was replicated with the potentially problematic activity.

Explanation for Findings

The associations found in the leisure side of the model support the tenets of Self-Determination Theory and can be explained by it. In this study we saw individuals orient themselves to their leisure activities the same way they typically approached things in life. Individuals who were globally more self-determined engaged in their leisure activities with an autonomous orientation. According to Vallerand (1997), global motivation can be conceptualized to be at the personality level, which refers to enduring individual differences. Global motivation orients a person toward how they typically interact with their environment. Motivation will be channelled from the global level, to the specific, or domain level.

Individuals who participated in leisure activities for pleasure or because they valued them as a means of self-improvement experienced positive leisure consequences, and good psychological functioning. These results can be explained by Self-Determination Theory. The reason why people perform an action reveals the regulatory process that underlies it, which can predict the nature of the outcome (Ryan et al., 1996). Actions that are performed

for autonomous reasons involve self-determination while those pursued for controlled reasons involve non self-determination (Ryan & Deci, 1999). Engaging in activities for autonomous reasons involves a sense of agency and choice, feels effortless, and is associated with greater coherence among aspects of the self and therefore less conflict (Ryan, Sheldon, Kasser & Deci, 1996) resulting in enhanced performance, persistence and general well-being (Deci & Ryan, 1990, Ryan, Deci, & Grolnick, 1995).

Alternatively, individuals who were less globally self-determined approached their leisure activities in their typically controlled fashion. Their leisure activities were not self-regulated, but rather regulated by internal or external pressure, or non regulated and were not associated with positive leisure consequences. Activities performed for controlled reasons are not associated with a sense of cohesion but rather based on conformity, incongruity, or conflict (Ryan & Deci, 1999) resulting in less positive consequences.

The associations on the gambling side of the model are complex, and several different explanations can be offered. Applying Vallerand's (1997) model to the negative relationship between global self-determination and all reasons for gambling suggests that individuals who approach life with an autonomous orientation do not generally gamble. This speculation is supported by the finding that global self-determination was not significantly correlated with gambling involvement. Perhaps there are no truly self-determined reasons for gambling. One might speculate that globally self-determined people do not choose activities that involve more luck than skill as a means of self-expression and pleasure. It may be that the nature of gambling, wherein reward or punishment in the forms

of losses or wins to a high degree is controlled by others, is not attractive to the globally self-determined person who enjoys the feeling of personal causation and seeks optimally challenging activities.

No previous research has been conducted on the global self-determination of gamblers, however, eight studies have included a measure of locus of control, which is a related construct. Of the eight, no studies have found that gamblers have a higher internal locus of control than non-gamblers and four found that the gamblers were significantly higher on external locus of control (see Walker, 1992, p. 98). The finding that global self-determination was negatively related to all motivations for gambling is consistent with these results. One might speculate that one of the attractions of gambling is that it offers a challenge to some people. The challenge may lie in beating the system, or it may be to accumulate substantial wealth. However, gambling may not be viewed as a challenge to those who accept that gambling odds are unfair and that beating the system is simply beyond one's capacity. A hallmark of global self-determination is the choice of optimally challenging activities. The globally self-determined individual may choose to engage in gambling occasionally, and probably views the session as entertainment. The loss of money will likely be anticipated, and budgeted for, while considering it the price of entertainment. Because the activity will be undertaken without a sense of pressure, or for any extrinsic reasons, the gaming will be self-regulated, and well-controlled. Positive experiences will result, contributing to good psychological functioning.

The significant link between gambling involvement and gambling problems, despite

engagement for self-determined reasons, does not conform to the Self-Determination Theory. However gambling research does support this link. It may be that situational factors combined with personal attributes play a role in the development of gambling problems when engaged in the activity frequently. Global self-determination appeared to play a protective role in this relationship and reduced the association between gambling involvement and gambling problems. However, while the association was significantly reduced, it was not eliminated. We can speculate on mechanisms by which gambling involvement can either lead to positive or negative consequences.

Vallerand (1997) has proposed that social factors have an influence on motivation. Laboratory research has shown that situational factors, such as rewards, can have a negative influence on situational intrinsic motivation (see Vallerand, 1997, for a review). One might speculate that a person who commences a gambling session for more self-determined reasons may become less self-determined towards the activity and more externally regulated because of the potential monetary reward. Should the gambling session become less self-regulated, the danger of failure of regulation arises. Failure of regulation of gambling can lead to financial losses. Oldman (1978) has proposed that habitual gambling can, but will not necessarily, lead to economic crisis and that it is repeated attempts to win money to solve the financial crises brought on by gambling that is viewed as compulsion. In other words, problem gambling is directly related to debt caused by losses. If one adopts Oldman's view, one could hypothesize that involvement in gambling for domain related self-determined reasons can lead to problems if situational failure of regulation, and

resulting financial loss, occurs too frequently.

One alternative explanation has been suggested by Baumeister, Heatherton, and Tice (1994). The Control Theory (Carver & Scheier, 1981) of self-regulation proposed mechanisms to explain how, rather than Deci and Ryan's (1990) theory of why, people regulate their behaviour. For these authors, self-regulation is characterized as self-control or self-stopping. Baumeister et al. (1994) proposed several mechanisms of self-regulation failure. One such mechanism is through a failure of self-monitoring. It is proposed that the capacity to self-monitor may be reduced by internal or external influences. For example, the desire to escape from self-awareness or being under alcoholic intoxication may be accompanied by a reduction in monitoring, attended by unusual and disinhibited behaviour. One might speculate that the normally well-regulated (self-determined) gambler may fail to self-stop, gamble and lose past the point of economic responsibility. In addition, Baumeister et al. (1994) have proposed that self-regulation requires a certain strength, which can be depleted when confronting stressful circumstances. Should this desire to escape from self-awareness or depletion of strength be the result of ongoing personal difficulties, such as work-related disappointment or relationship breakdown, incidents of self-regulation failure may be repeated. Under these conditions, high involvement in gambling may offer frequent opportunity for self-regulation failure, and the development of gambling problems. The combination of these two theories of self-regulation that take into consideration the individual and the contextual circumstances may help us to understand how the individual whose involvement in gambling for self-determined reasons can lead to

gambling problems.

Interviews with pathological gamblers reveal that onset of problem gambling frequently coincides with personal losses such as divorce or death, self-esteem, and personal security (Whitman-Raymond, 1988). Corless and Dickerson (1989) found that problem gamblers differed from high frequency players in that negative emotion in the form of disappointment or frustration increased the likelihood of a session beginning, and a losing session would more likely continue when faced with debts.

Another alternative explanation for the significant link between involvement and gambling problems, despite involvement for self-determined reasons is that the nature of gambling does not lend itself to explanation by the Self-Determination Theory. Perhaps normally self-determined reasons for an activity cannot be applied to gambling. Evidence for this statement lies within the gambling research. First, intrinsic motivation for stimulation is described as experiencing pleasant sensations associated mainly with one's senses. In the case of gambling, stimulation is in the form of arousal or excitement, rather than smell, taste, touch, or hearing. This arousal can accompany wins or losses (the near miss). The stimulation lies in the nature of the activity, rather than in the pleasure of doing the activity. Arousal has been found to induce continued play and future gambling, and has been associated with problem gambling in several studies (see Stirpe, 1995). A subset of problem gamblers have been named "action" gamblers because they cite excitement of the action as the compelling reason for their gambling. Second, intrinsic motivation for accomplishment is described as engaging in a given activity for the pleasure and satisfaction

experienced while one is attempting to surpass oneself, or to accomplish or create something. The intrinsic motivation to accomplish items of the Gambling Motivation Scale describe being motivated to gamble to test one's self-control or to control the game. The nature of gambling allows little opportunity for control of the game, particularly in the case of slot machines or lotteries. Regular and high-frequency gamblers have been found to have more erroneous beliefs about skill and chance, and the illusion of control than low frequency gamblers. These cognitive distortions have been associated with problem gambling (Dickerson & Adcock, 1987; Gadboury and Ladouceur, 1989; Griffiths 1990,1993 as cited in Stirpe, 1995). Third, identified regulation involves choice, and its outcomes are congruent with one's goals and values. The identified items on the Gambling Motivation Scale include motivation to relax, relieve tension, and distract oneself from concerns. Such motivation may be adaptive for a functional activity, and yet non-adaptive with a potentially problematic behaviour. A subset of problem gamblers report playing to forget troubles (Dickerson, 1993), and have been termed "escape" gamblers.

Individuals lacking in coping skills are more likely to have gambling behaviour escalate into a problem. Patients with serious gambling problems have been found to utilize significantly more avoidant and impulsive coping styles (McCormick, 1994; Sharpe & Tarrier, 1993). Corless and Dickerson (1989) interpret their findings as insight into how a habitual problem of gambling, together with its associated degree of impaired control, can be driven by negative emotions. These authors surmise that once gamblers learn to avoid or modify negative mood states through gambling, in the absence of other problem solving

strategies or good social support, gambling may become their main method of coping with all negative emotions.

These clinical observations may foster conjecture that original motivations for pleasure through stimulation and relaxation may change in nature to maladaptive coping strategies. Life crises may predispose an individual to volitional loss of self-awareness. Gambling can be an absorbing activity, whether through the high arousal experienced at the craps table, or the mind-numbing repetition of the slot machine, and can provide an escape from the source of stress. The activity that was once a source of relaxation, may have become a means to escape, and no longer truly self-regulated. The hypothesis that a life stressor mediates the association between gambling involvement and gambling problems is worthy of further investigation.

It is also possible that the positive relationship between involvement and gambling problems is a weakness in the construction of the Gambling Motivation Scale. It may be that the intrinsic and identified items did not adequately represent the more self-determined motivations for gambling. Or, it may be that some items are ambiguous, and can mean different things to different people, which is supported by the different pattern of correlations between sub-scales for individuals who did not did not meet criteria for possible problem gambling. The most obvious difference is in the interpretation of the amotivation questions. The substantive meaning an individual who predominantly gambles to go along with the crowd attributes to the item "I gamble, but sometimes I wonder what it does for me" would seem to be very different from that of an individual who feels

compelled to gamble. In addition, the items on the identified regulation sub-scale may interpreted as motivation to engage in a pleasurable form of relaxation, or as a means to escape one's problems.

The reasons for gambling considered to be more self-determined were associated with greater gambling involvement, as measured by frequency. This makes intuitive sense, and conforms to Deci and Ryan's (1990) Self-Determination Theory. If one engages in an activity for pleasure, or because it is highly valued, one will perform the activity frequently. Furthermore, applying Deci and Ryan's (1990) theory, because the gambling activity is self-regulated, this involvement will be associated with good psychological functioning.

Less self-determined reasons for gambling were associated with gambling problems, which is also in keeping with Self-Determination Theory. Gambling activity that is not self-regulated will likely be poorly regulated. If gambling behaviour is regulated by an effort to impress, or become rich, or not regulated at all, the activity will surely become problematic and associated with poor psychological functioning, which is demonstrated in the results of this study.

Gambling for less self-determined reasons appears to lead directly to problems, without the need for high frequency play or a mediating factor. As previously mentioned, problem gamblers report gambling to be viewed as a "big shot". Gambling to feel important or to impress others indicates introjected regulation. Gambling is regulated by internal pressure, and is therefore not congruent with the self. It easy to imagine that the gambler can achieve the image of being "cool" by not showing too much elation when

winning, nor emotional distress when losing. Therefore, win or lose, the gambling session continues regulated by the image, rather than by the person.

Gambling to win money coincides with external regulation. Regulation of gambling is not by the self, but by the potential reward. Rewards in gambling are typically presented on an intermittent reinforcement schedule to encourage the player to continue. However, the odds of the house are set so that the house will always win in the long run. The externally regulated gambler has set out to achieve a non-achievable goal. Money lost is not written off as the cost of entertainment, but rather as a temporary setback or investment which may lead to chasing. Chasing has been identified has one of the central characteristics of the behaviour of problem gamblers. After sustaining a series of losses the gambler believes that there is a zero probability of recouping the loss without further gambling, but does not realize that the probability of further financial loss is also zero if the gambler quits, and substantially greater than zero if gambling continues (Dickerson, 1993). We can surmise that the individual who gambles using external regulation requires little involvement before the onset of gambling problems.

Finally, gambling amotivation was linked to problem gambling. Gambling amotivation involves non-regulation of the activity. The gambler who gambles, wanting an outcome but has no sense of control over the game, probably gambles in a disorganized, uncontrolled fashion which leads to problems. Perhaps the amotivated problem gambler hopes, but no longer believes he can win because of the expectancy of uncontrollability. Alternatively, the gambler who already has problems and intends to behave in one way (i.e.

to not gamble), yet behaves in a different way (i.e. gambles), because of internal forces such as impulses (compulsion) displays amotivation.

In summary, the replication of the leisure side of the model can be explained by Deci and Ryan's (1990) Theory of Self-Determination and Vallerand's (1997) hierarchical model of motivation and provides evidence that the sample of gamblers in this study was not different from respondents in past research. Results of the gambling side of the model were less conclusive. Although Self-Determination Theory can explain some of the findings, and can be used to speculate on others, further research is required to determine whether it is appropriate for use in research with potentially problematic behaviours.

Theoretical Implications

The findings from this study have several implications for Self-Determination Theory and research. The results of the leisure side of the model support the use of Deci and Ryan's (1990) Self-Determination Theory in research with what could be considered functional behaviours. These findings reveal that motivation is an important predictor of behavioural consequences.

The results of the gambling side of the model provide limited support for the use of this theory in research with potentially problematic activities. The finding that global self-determination was negatively related to all reasons for gambling may indicate that development of problematic behaviours may not be effectively studied using Self-Determination Theory in the same way as functional behaviours because there are no truly self-determined reasons for engaging in the behaviours. Alternatively, the negative link

between global self-determination and high self-determination for gambling may be because items included in the intrinsic and identified sub-scales are inadequate representations of these constructs. If a weakness in the Gambling Motivation Scale is responsible for the negative link between global motivation and self-determined reasons for gambling, then it is possible that the theory can be applied to problem behaviours in the manner previously used with adaptive activities. Further research is required to determine the utility of using Self-Determination Theory to explain problem behaviours.

The results of the leisure side of the model support the use of Vallerand's (1997) hierarchical, domain specific theory in research with functional behaviours. Global motivation can be used to predict domain specific motivation, and related consequences. The poor fit of the alternate model predicting gambling consequences from leisure motivation supports Vallerand's (1997) proposal that consequences are specific to the domain.

The finding that a lack of global self-determination and a controlled orientation toward gambling was directly related to gambling problems provides insight into the development of problem gambling, and pathology in general. These results support Ryan, Deci and Grolnick's (1995) previously untested contention that disturbed autonomy is involved in pathological behaviour. Autonomy is seen to be related to intrinsic motivation and the internalization of processes and structures into the self during the developmental process. Self-determination of behaviour represents the developmental outcomes of autonomy. Failure to internalize significant values and regulatory processes results in

autonomy disturbances. The absence of this internalization, and the resulting lack of autonomy, results in a controlled orientation toward an activity and inconsistent regulation of behaviour. These authors further proposed that disturbed autonomy is multi-determined, with genetic, interpersonal, and sociocultural factors all being relevant. It was also proposed that autonomy develops in the presence of familial and social contexts that provide autonomy support, optimal structure, and interpersonal involvement. The discovery that disturbed autonomy, expressed as controlled orientation toward an activity, can predict the presence of a problem behaviour together with evidence for the factors that can influence the development of autonomy (see Ryan et al., 1995, for a review) suggest avenues for prevention of pathology and intervention with a clinical population.

Practical Implications for Gambling

While interpretation of the results must be cautionary, there is some evidence that motivation does play a role in the development of problem gambling if we accept that the Gambling Motivation Scale is capturing motivation differing in degree of self-determination. With these results one can predict who will gamble occasionally, who will gamble frequently, and who will develop gambling problems. Highly globally self-determined individuals will not be at risk, while those who are less self-determined may face risk depending on their motivations for gambling. Individuals who gamble for autonomous reasons may regulate their gambling in a fashion that brings pleasure, rather than problems. However, we can hypothesize that should these same individuals be faced with large losses, personal crises, or life stressors, they may be at risk for developing

problem gambling. This risk may be attenuated by their level of self-determination which may influence the degree to which they cope with these challenges. The gambling behaviour of individuals who gamble for controlled reasons will be regulated by forces outside themselves and therefore not under their control and apt to become problematic.

Knowing who is at risk and how problems develop allows us to improvise strategies for the prevention and treatment of problem gambling. Problem gambling has acquired a high profile of late, and information has begun to be disseminated to the public. Most of this information concerns statistics on the prevalence of problem gambling and how to assess whether one, or one's loved one, is showing signs of problem gambling. Cautionary advice could be added to this material concerning the risk involved for those who gamble to feel important or with a conviction that they will become rich. Should future research support the hypothesis that gambling can be a maladaptive coping strategy, warnings concerning the use of gambling to find relief from a current stressor and suggestion of other coping strategies could alert individuals at risk for letting their gambling behaviour get out of hand. Having an understanding of the mechanism through which gambling problems develop could assist clinicians in targeting the specific motivational contributor to the gambling problems as well as the enhancement of global self-determination.

The finding that global self-determination moderates the relationship between gambling involvement and problem gambling suggests that the enhancement of global self-determination could be a valuable goal for therapeutic interventions. The development of a more self-determined approach to life could provide protection against relapse, or the

development of an alternative problematic behaviour. Vallerand (1997) has suggested that global self-determination can be influenced by social factors. Social contexts that provide perceptions of competence, autonomy and relatedness to others promote the integration of behaviours. Increased integration of behaviours leads to more self-determined regulation, increased positive consequences, and increased global self-determination.

This research contributes to the effort to determine factors that can influence the extent to which people develop problems with gambling. It provides preliminary evidence that motivation plays a role in the selection and regulation of gambling activities. The application of a theoretical model to these findings allows us to begin to understand the mechanism underlying the development of problem gambling. This understanding can lead to potential insight into prevention and intervention techniques.

Limitations

Although the present research provides support for the use of Self-Determination Theory in the prediction of behaviour and consequences and makes a first step in its use with a problematic behaviour, it is important to highlight existing limitations. As with all correlational designs the attribution of causality between constructs must be tempered. The modification indices of the SEM do provide some information as to reverse causation, or reciprocal/circular causation, however only the results of longitudinal design can unequivocally be interpreted as causal. The moderate fit of the model to the data suggests that one or more relevant constructs were not included, and accordingly variance left unexplained. Second, and also related to statistical analysis, is the sample size, which was

the minimum for a model of this complexity.

A third limitation of this study, also related to the sample, is that it is not an exact representation of the population. The less than 5% prevalence rate of pathological or problem gambling would require five times the number of respondents in this study to include a meaningful number of respondents meeting these criteria. The limited time and resources available precluded recruiting a sample of this size and it was necessary to target individuals who were known to gamble. Therefore, the possibility of bias exists due to the selection process and the representativeness of the population as a whole is uncertain.

Fourth, recruitment of problem gamblers proved to be a challenging undertaking, and respondents had to be garnered from several different sources. The predominant reason given for refusal to participate was the length of the questionnaire. Inclusion of three motivational sub-scales not only contributed to the time required to complete the questionnaire package but, according to some self-disclosed respondents, made for a very repetitive task. In addition, individuals who suspected that they were having difficulty with their gambling regulation may have been reluctant to participate in order to avoid confronting the problems. The various sampling procedures may have resulted in the inclusion of unidentified confounds that weaken results. In addition, it was necessary to include all forms of gambling, rather than concentrating on specific forms that could be considered skill versus chance games which might have provided more detailed results. However the variety in the sample does improve the generalizability of the results.

Fifth, as previously mentioned, there may be limitations in the construct validity of

the Gambling Motivation Scale when employed in a sample that includes a pathological group. Although the structure of the scale showed internal consistency and replicability, construct validity in the form of the continuum was questionable. This evidence was not available before data collection and the use of the questionnaire in this research was justified by its applicability to the theory and its prior use in gambling research. The results of this study suggest that modification of the scale may be required and further testing to establish its validity.

The sixth limitation is the absence of a determinant of self-determined motivation for gambling and possible mediating variables between gambling involvement and problem gambling. If the Gambling Motivation Scale is measuring self-determined reasons for gambling, the unexpected negative association of the global self-determination predictor with self-determined reasons for gambling leaves the model incomplete. Measurement of potential mediating factors between involvement and gambling problems such as relationship dissatisfaction, financial stress, and job dissatisfaction were considered, however, measurement of these contextual factors were not included in an effort to reduce the size of the questionnaire package. Inclusion of such variables would assist us in understanding what conditions might influence an individual who usually gambles for self-determined reasons to fail in regulating gambling activities.

Finally, the limitations that always exist with self-report questionnaire research are present. The response rate of questionnaire research can be considered to be an index of data quality because it defines the extent of possible bias from nonresponse (Judd, Smith, &

Kidder, 1991, p. 216) and the approximately 15% response rate in this research allows for such bias. There is no way of knowing if non-respondents differed in ways that limit the generalizability of these results to the gambling population. The accuracy of the data is also untestable. Distortion may arise from deliberate or inadvertent reasons, from social desirability or from misunderstanding. It is hoped that the questionnaire format actually increases accuracy because the anonymity allows people to answer honestly without fear of judgment. However, when sampling a clinical population it is possible that individuals will not answer candidly in an effort to avoid facing their own reality.

Future Directions

The negative association between global self-determination and self-determined reasons for gambling and evidence that more autonomous reasons for gambling could also be associated with problem gambling through involvement raises questions. The problem remains, is it appropriate to use Self-Determination Theory to explain problem activities? Is there something inherent in the activity of gambling that can subvert even self-regulated activity? Are there contextual or situational factors that can undermine self-determination? Alternatively, were the results due to a weakness in the Gambling Motivation Scale?

Additional research is required to confirm that Self-Determination Theory and the hierarchical model can be applied to problem behaviours. Investigation into the construct validity and generalizability of the Gambling Motivation Scale is required before it is used in further research with a problem gambling population. The French version of the scale was validated with a random sample of individuals recruited at a horse race track. Seventy-

one percent of the respondents identified betting on horses as their preferred form of gambling. A measure of compulsion was included but it is unknown whether the sample included individuals who met criteria for probable problem gambling. Investigation as to whether the simplex pattern appears with different forms of gambling, and with problem as well as non-problem gamblers is required before results using this scale can be interpreted with confidence.

Replication of this study would attest to the stability of the results. Subsequent research should include a contextual variable that might explain the relationship between involvement and problem gambling. Contextual variables such as work related difficulties, relationship breakdown, or alcohol consumption would test Baumeister et al.'s (1994) proposal that external influences reduce the ability to self-monitor and lead to failure of regulation. A measure of gambling losses would address Oldman's (1978) theory that problem gambling is directly related to financial debt. The potential for financial loss may be the inherent component of gambling that provides the factor that undermines self-determined reasons for gambling.

Adoption of the hierarchical design with two different activities, one adaptive and one potentially problematic, and replication of the results of this study, would provide support for the interpretation that globally self-determined individuals do not engage in potentially problematic activities. Global self-determination should be tested as a moderator of the relationship between involvement in the potentially problematic activity and its consequences to confirm that it can serve a protective role in the development of

problem behaviours.

Future research including measures of motivation of two potentially problematic activities and their consequences would test the proposal that a lack of global self-determination and a controlled orientation toward an activity is related to the development of pathology in general. Clinical observations suggest that the rates for problem and pathological gambling are significantly higher in certain groups. Individuals with other addictions, primarily alcohol and drug addictions, are more likely than the general population to have gambling problems (Ramirez, McCormick, Russo, & Taber, 1983). Gambling and substance problems may be simultaneous or sequential. Some individuals report that the problems began simultaneously and coexisted, while some report more of a cycling phenomenon (Ramirez et al., 1983). Some people abuse alcohol or drugs during the losing phase of their gambling (Lorenz, 1995) or during abstinence from gambling (Lesieur, Blume & Zoppa, 1986). Conversely, there is anecdotal evidence that abusive gamblers with an alcohol problem can become pathological gamblers once they quit drinking or using drugs (Lesieur, Blume & Zoppa, 1986; Lorenz, 1995). Similar patterns are sometimes seen with compulsive overeating or compulsive shopping (Blume, 1994). This phenomenon is termed "switching." Switching addictions is defined as a substitution of one drug of choice or one set of addictive behaviours for another, while continuing a pattern of addiction (Blume, 1994). A hierarchical model similar to the one tested in this study with the inclusion of the Global Self-Determination Scale, Gambling Motivation Scale, a measure of motivation to consume alcohol, measures of involvement in gambling

and the consumption of alcohol, the South Oaks Gambling Screen, a measure of alcohol abuse (such as the Michigan Alcohol Screen Test), and measures of psychological functioning could evaluate the possibility that low self-determination contributes to the development of problem behaviours and conversely, the protective quality of high global self-determination. The finding that global self-determination is negatively related to both substance abuse and gambling problems would provide a plausible explanation for the phenomenon of switching. Individuals with low global self-determination may be generally susceptible to the development of problem behaviours. The replication of the finding that global self-determination moderates the relationship between gambling involvement and gambling problems, with the possible finding that it also moderates the relationship between involvement in alcohol consumption and substance abuse, would attest to the protective role global self-determination plays. Additional analyses assessing the relationship between gambling involvement and gambling problems while controlling for alcohol consumption and substance abuse would test the hypothesis that alcohol consumption can play a role in the development of gambling problems.

It is possible that loss of inhibition caused by mood altering substances reduces an individual's self control and leads to gambling problems. Research conducted in a naturalistic setting, such as a bar in the Province of Quebec where video poker machines are available, could evaluate the effect of alcohol on gambling behaviour. Loss of control over gambling could be operationalized as betting more money and/or playing longer than planned. Gamblers' intentions would be recorded prior to the gambling session, and actual

money and time spent playing and alcohol consumption would be monitored during the gambling session. The relationship between alcohol consumption and the discrepancy between intention and behaviour would serve as a measure of the effect of alcohol on self control.

Proceeding from the assumption that the majority of individuals who are attracted to gambling are not to a high degree globally self-determined, those who engage in gambling for what would be considered to be more "self-determined reasons" are at risk if they become highly involved. Even more at risk, are individuals who participate in gambling for less self-determined reasons.

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APPENDIX A

Questionnaire used in Pilot Study

Verbal Directions to Students

After having obtained permission to distribute the questionnaire to the students from the professor, the following steps were taken:

1. The professor was asked to leave the classroom while the students completed the questionnaires.

2. The students were informed by the researcher that they were under no obligation to complete the questionnaires. They were informed that the intention of this study is to investigate the relationship between individual circumstances, reasons for gambling, and gambling behaviour. If they wished, they might immediately refuse to complete the questionnaires, or they might elect to discontinue any time. Participation was entirely voluntary. In the event that there were those who did not wish to take part: (1) if the subjects were completing the questionnaires at the beginning of a class, those not participating were asked to occupy themselves in an activity that did not disturb participants: (2) if the subjects were completing the questionnaire at the end of the class, those not participating were free to leave.

3. Instructions for completing the questionnaires were explained verbally to subjects. These instructions contained: (a) An explanation of the nature of the questionnaires, ie., the questionnaires were neither tests nor examinations, and that there are no right or wrong answers: (b) That the information collected was solely for the purpose of research; (c) That in order to insure confidentiality, we asked that no-one put their name on the questionnaires; (d) Assurance that the data collected would be treated globally (i.e. as a member of a group of subjects) and that no one besides the researcher would have access to the individual sets of data (e) and invitation to contact the researcher should they have any concerns following participation in the study. Only the collective results of the study would be presented in the final report. This report would comprised of global information for the complete sample of subjects completing the questionnaires.

Verbal Directions to Members of GA

After having obtained permission to distribute the questionnaire to addendees of the meeting from the chairperson, the following steps will be taken:

1. The members will be informed by the researcher that they are under no obligation to complete the questionnaires. They will be informed that the intention of this study is to investigate the relationship between individual circumstances, reasons for gambling, and gambling behaviour. If they wish, they may immediately refuse to complete the questionnaires, or may they may elect to discontinue any time. Participation is entirely voluntary. The questionnaires will be fill out after the meeting by those who wish to participate.

2. Instructions for completing the questionnaires (see appendix C) will be explained verbally to subjects. These instructions contain: (a) An explanation of the nature of the questionnaires, ie., the questionnaires are neither tests nor examinations, and that there are no right or wrong answers; (b) That the information collected will be solely for the purpose of research; (c) That in order to insure confidentiality, we ask that no-one put their name on the questionnaires; (d) Assurance that the data collected will be treated globally (i.e. as a member of a group of subjects) and that no one besides the researcher will have access to the individual sets of data. Only the collective results of the study will be presented in the final report. This report will be comprised of global information for the complete sample of subjects completing the questionnaires.

3. Finally, it will be made known to the subjects that the global results of the study will be available by the month of September, 1998. A copy of the report that includes the results from all the subjects will be available for those who request it by contacting Luc G. Pelletier, Ph.D., School of Psychology, University of Ottawa, Lamoureux Building. Subjects wanting to receive a copy of the report may detach the first part of the questionnaire which contains the contact information of the principle researchers.

Université d'Ottawa • University of Ottawa

École de psychologie School of Psychology

(ADDRESS)

Dear

A study is in the planning stages at the University of Ottawa under the direction of Dr. Luc Pelletier, School of Psychology. A pilot project is now being conducted. The purpose of this pilot is to perform a preliminary investigation of a stress-diathesis model of the development of problem gambling and to refine and validate questionnaires to be used in the proposed project. Very briefly, we wish to examine the relationship between environmental stress, fulfillment of self-determining needs, motivation for gambling, gambling behavior and the consequences of gambling behaviour in order to identify factors that place individuals at risk for developing problem gambling. A more detailed description of the rationale and intended methodology of the research project is enclosed for review.

In addition to your centre we are contacting_____to request help in recruiting subjects for this pilot project. As outlined in the accompanying document, we are in need of approximately 20 subjects in the next few months. We are seeking approval for this project from yourself, as director of _____, so that we may then proceed to invite the co-operation of the therapists on your staff.

While we are open to a variety of possible methods for subject recruitment, we have formulated one method that seems particularly appealing because of the time constraints. Therapists at your centre would be sent a letter containing a brief description of the study and an explanation of their role in the study, along with several questionnaire packages. A copy of this letter is enclosed for your reviewing. We have also enclosed a sample of the questionnaire package that clients wil be asked to complete. Basically, the letter will ask therapists to distribute the questionnaire packages to their patients at the end of a therapy session of their choice. Included is a script of instructions that we would like therapists to read to the patient when giving the questionnaire package. This script will inform clients that: (1) their involvement in the study is voluntary, (2) responses to the questionnaires are completely confidential and anonymous - therapists will not have access to their responses. (3)completion of the questionnaires is to be done at the Centre following their appointment. Giving the client the questionnaire package and reading the instructions should not take any longer than 5 minutes.

We would very much appreciate the involvement of _____ in this research project. We realize that participation in this study will place an extra demand on the time and energy of your therapists and clients, however we feel that their involvement would be a very valuable contribution for furthering our present understanding of problem gambling. In vew of this, we

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would be very willing to visit your centre to present the findings at the completion of the project should you be interested. In addition, a written summary of the findings will also be made available to your centre. Should you have any questions, please do not hesitate to contact us at (613) 596-0772.

Yours truly,

Luc G. Pelletier, Ph.D. and
Marilyn Keyes, M.A.
School of Psychology
University of Ottawa
125 Jean-Jacques Lussier
Ottawa, Ontario
K1N 6N5

Université d'Ottawa • University of Ottawa

École de psychologie School of Psychology

(ADDRESS)

Dear _____

A study is in the planning stages at the University of Ottawa under the direction of Dr. Luc Pelletier, School of Psychology. A pilot project is now being conducted. The purpose of this pilot is to perform a preliminary investigation of a stress-diathesis model of the development of problem gambling and to refine and validate questionnaires to be used in the proposed project. Very briefly, we wish to examine the relationship between environmental stress, fulfilment of needs, motivation for gambling, gambling behavior and the consequences of gambling behaviour in order to identify factors that place individuals at risk for developing problem gambling.

In addition to your centre we are contacting_____ to request help in recruiting subjects for this pilot project. We are in need of approximately 25 subjects in the next few months.

Your participation is very important for the success of this study, yet actually requires very little of your time (approximately 5 minutes). Also, your participation, and that of your patients, is on a voluntary basis. We would like to ask that you give one of our questionnaire packages to each of your patients at the end of a therapy session of your choice. Patients will be asked to complete the package before they leave. A copy of the questionnaire package is enclosed for your reviewing. If you have any questions please contact us at (613) 596-0772.

Finally, before giving the questionnaire package to you clients, we ask that you read a short set of instructions to them. This is a very important procedure which helps to ensure that the client has a good understanding of what it is that s/he is being asked to do. The instructions have been written on a separate page which you should find enclosed in this letter.

We would like to extend to you our deep appreciation for your co-operation in this research project. We fully acknowledge that your involvement will require additional time and energy in a schedule that is already very demanding. However, we sincerely hope you will agree that his is a worthwhile investment of your time. A report summarizing the results of the study will be made available to you once the study has been completed. You can request this report by calling us at the number listed above. We look forward to working with you.

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Yours truly,

Luc G. Pelletier, Ph.D. and
Marilyn Keyes, M.A.
School of Psychology
University of Ottawa
125 Jean-Jacques Lussier
Ottawa, Ontario
K1N 6N5

RESEARCHERS

Marilyn Keyes is a doctoral candidate in clinical psychology at the University of Ottawa. She will be working under the direction of Dr. Pelletier. This research is supported by a Social Science and Humanities Research Scholarship.

Dr. Luc Pelletier is an Experimental Psychologist who specializes in the study of motivation and self-regulation.

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NEW

RESEARCH

PROJECT

THE STUDY

Marilyn Keyes, a graduate student at the University of Ottawa, is conducting a study under the direction of Dr. Luc Pelletier, School of Psychology.

- **What is the study about?**

The study is about the relationship between people's perceptions of themselves, their lives, and their reasons for engaging in gambling activities.

- **What do participants do?**

Participation involves filling out a package of questionnaires.

- **How long will it take?**

While the time varies among people, the questionnaires take about 40-45 minutes to complete.

WHAT YOU GET

Volunteers will get an opportunity to contribute to our understanding of the development of problem gambling - variables that place a person at risk and the mechanism through which the individual is susceptible to those risk factors.

HOW TO GET INVOLVED

If you require further information about the study please feel free to call (613) 596-0772, or just ask the receptionist for a study package. You can fill out the questionnaires at home and drop them in the mail when you have completed them. A postage-paid envelope is included.

Instructions to Clients

(read before handing out questionnaire package)

"A study is currently being conducted by some researchers working at the University of Ottawa in the School of Psychology. They are interested in understanding the relationship between people's perceptions of themselves, their lives, and their reasons for engaging in gambling activities. The researchers are in need of people like yourself to complete this package of questionnaires. the questions are basically concerning your thoughts and feelings about yourself, your life circumstances, and your gambling behaviour. They have asked me to give you this questionnaire package which you can fill out before you leave. It will probably not take longer than 30 minutes to complete.

It is important for you to know that your decision to complete these questionnaires is entirely up to you, and will in no way affect our therapeutic relationship. In other words, you have a choice as to whether or not you would like to participate in this study and you will not be penalized for your decision. Your answers are completely anonymous and confidential. Nowhere in the questionnaire package are you required to give your name. Also, no one but the researchers will have access to your answers. I will never see them.

There is a set of instructions included in the questionnaire package along with the name and telephone number of the principal researcher if you should need to contact him with questions about the study."

Université d'Ottawa • University of Ottawa

École de psychologie School of Psychology

Instructions for Completing the Questionnaire Package

A study is presently being conducted at the University of Ottawa under the Direction of Dr. Luc Pelletier, School of Psychology, concerning the relationship between people's perceptions of themselves, their lives, and their reasons for engaging in gambling activities. Marilyn Keyes, a graduate student supervised by Dr. Pelletier, is a principal researcher of this project. We would be very pleased to have your participation in this research.

Participation in this research is entirely voluntary. The decision to participate, or not, is yours. Nowhere in the package will you be asked to give your name, so your identity will remain unknown and your answers will be anonymous. The answers will be coded and combined with those of others who have participated. They will be analysed as a group, rather than on an individual basis. In addition, answers will be kept confidential. No one other than the involved researchers will have access to your responses and these responses will be kept in a locked cabinet in Dr. Pelletier's research laboratory at the University of Ottawa. Only the collective results of the study will be presented in the final report. This report will be comprised of global information for the complete sample of subjects completing the questionnaires.

If you agree to participate in this study, your participation will involve completing this questionnaire package. While the time varies among people, the questionnaire takes about 40 to 45 minutes to complete. When answering the items, we ask that you try to answer them as accurately as possible. It is important to remember that there are no right and wrong answers, we are simply interested in your opinions. Also, we encourage you not to leave any items unanswered, but instead pick the response that best describes your thoughts and feelings for the item. Of course, you are not obligated to answer any question you do not feel comfortable in responding to. Some of the questions concern relationships, finances, moods, and other aspects of a personal nature. It is possible that some individuals may experience mild discomfort when filling them out. Should you have any concerns or questions following completion of the questionnaires, please do not hesitate to telephone us at (613) 596-0772 or (613) 562-8000 (ext. 4201), and we will assist you in identifying the appropriate course of action to address your concerns.

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(613) 562-5799 • Telec./Fax (613) 562-5147

If you wish to receive a copy of the report on this study, you can contact us by phone or by mail at the phone number or the address indicated below (you can detach this page from the questionnaire and keep it if you decide to contact us later).

We would like to extend our appreciation for your co-operation in this research project.

Sincerely,

Luc Pelletier, Ph.D. and Marilyn Keyes, M.A.
School of Psychology
University of Ottawa
145 Jean-Jacques Lussier St.
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LEISURE ACTIVITIES QUESTIONNAIRE

Please indicate your level of interest and involvement in the following activities. Circle a number or question mark for each activity.

	No interest at all	Moderate interest	Heavy interest	Obsessive interest	I don't know
Watching television	1	2	3	4	?
Playing cards	1	2	3	4	?
Playing cards for money	1	2	3	4	?
Betting on sports	1	2	3	4	?
Betting horses	1	2	3	4	?
Playing the lottery or numbers	1	2	3	4	?
Playing dominoes or dice for money	1	2	3	4	?
Playing slot or video machines for money	1	2	3	4	?
Playing bingo for money	1	2	3	4	?
Gambling in casinos	1	2	3	4	?
Stocks, commodities or options	1	2	3	4	?
Other gambling or betting activities Please name_____	1	2	3	4	?

ATTITUDES TOWARD GAMBLING

With the help of the items below please indicate to what point (on a scale of 1 to 7) each statement corresponds with the reasons you gamble at your favourite game. For example, if the statement does not correspond at all with your personal reasons for gambling circle 1; if it corresponds moderately circle 4, if it corresponds exactly circle 7.

When you gamble, what game do you prefer? (Lotto, Blackjack, Bingo, Sports, etc.) _____

Does not Correspond at All		Corresponds a Little		Corresponds Moderately		Corresponds a Lot		Corresponds Exactly
1	2		3	4		5	6	7

WHY DO YOU GAMBLE AT YOUR FAVOURITE GAME?

1. Because it's exciting to play with money	1	2	3	4	5	6	7
2. For the pleasure I get when I improve my knowledge of the game.	1	2	3	4	5	6	7
3. For the feelings of efficacy I feel when I gamble.	1	2	3	4	5	6	7
4. Because it is the best way for me to relax completely.	1	2	3	4	5	6	7
5. Because it makes me feel like someone important.	1	2	3	4	5	6	7
6. I gamble to become rich.	1	2	3	4	5	6	7
7. I gamble, but sometimes I ask myself if I should continue gambling at my favourite game.	1	2	3	4	5	6	7
8. Because of the enormous rush I get.	1	2	3	4	5	6	7
9. For the satisfaction of learning new ways to gamble at my favourite game.	1	2	3	4	5	6	7
10. Because gambling permits me to test me self-control.	1	2	3	4	5	6	7
11. Because it is the best way I know to get rid of tension.	1	2	3	4	5	6	7
12. To show others that I am a dynamic person.	1	2	3	4	5	6	7

Does not Correspond at All 1	2	Corresponds a Little 3	Corresponds Moderately 4	5	Corresponds a Lot 6	Corresponds Exactly 7
13. I gamble to buy something that I dream about.	1	2	3	4	5	6 7
14. I gamble, but sometimes I wonder what it does for me.	1	2	3	4	5	6 7
15. For the strong sensations I get when I gamble at my favourite game.	1	2	3	4	5	6 7
16. Because I am curious about what can happen in the course of the game.	1	2	3	4	5	6 7
17. For the satisfaction I get when I can control the game.	1	2	3	4	5	6 7
18. Because it is the past time I choose to distract myself from my concerns.	1	2	3	4	5	6 7
19. So that others will envy me.	1	2	3	4	5	6 7
20. To make money quickly and easily.	1	2	3	4	5	6 7
21. I gamble, but sometimes I get the impression that I don't get much out of it.	1	2	3	4	5	6 7
22. I gamble for the thrill or strong sensations I experience.	1	2	3	4	5	6 7
23. For the pleasure of knowing my capabilities at this game.	1	2	3	4	5	6 7
24. For the feeling of control it gives me.	1	2	3	4	5	6 7
25. Because it is the best way I know of getting together with my friends.	1	2	3	4	5	6 7
26. Because I feel important when I win.	1	2	3	4	5	6 7
27. I gamble to make a little money.	1	2	3	4	5	6 7
28. I gamble, but sometimes I wonder if it's good for me.	1	2	3	4	5	6 7

SOUTH OAKS GAMBLING SCREEN

Please indicate which of the following types of gambling you have done in the last year. For each type, mark one answer: "Not at all", "Less than once a week", "Once a week or more".

	Not at all	Less than once a week	Once a week or more
Play cards for money	1	2	3
Bet on horses, dogs or other animals (Off Track Betting, the track or with a bookie)	1	2	3
Bet on sports (parlay, Pro-Line, with bookie)	1	2	3
Played dice games, including craps, over and under, or other dice	1	2	3
Went to casino (legal or otherwise)	1	2	3
Played the numbers or bet on lotteries	1	2	3
Played bingo	1	2	3
Played the stock and/or commodities market	1	2	3
Played slot machines, poker machines, or other gambling machines	1	2	3
Bowled, shot pool, played golf, or some other games of skill for money	1	2	3
Pull tabs or "paper" games other than lotteries	1	2	3
Bet on games such as backgammon or mah jong	1	2	3
Some for of gambling not listed above (Please specify)_____	1	2	3

2. What is the largest amount of money you have gambled in the last year within any one day?

_____ never have gambled _____ more than $100 up to $1,000

_____ $1 or less
_____ more than $1 up to $10
_____more than $10 up to $100
_____ more than$1000 up to $10.000
_____ more than $10,000

3. What is the longest amount of time you have gambled in the last year within any one day?

_____ never have gambled
_____ 1 hour or less
_____ more than 1 hour up to 3
_____more than 3 hours up to 6
_____ more than 6 hours up to 9
_____ more than 9 hours up to 12
_____ more than 12 hours

4. Check which of the following people in your life has (or had) a gambling problem:

_____father
_____grandparent
_____another relative
_____mother
_____my spouse or partner
_____a friend or someone else important in my life
_____brother or sister
_____my child(ren)

5. 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

6. Have you ever claimed to be winning money gambling in the last year, 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

7. Do you feel you have had a problem with betting money or gambling in the last year?
_____no
_____yes, in the past but not now
_____yes

8. Over the last year did you ever gamble more than you intend to? _____yes _____no

9. Over the last year have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true? _____yes _____no

10. Over the last year have you felt guilty about the way you gamble or what happens when you gamble? _____yes _____no

11. Over the last year have you felt like you would like to stop betting money or gambling but didn't think you could? _____yes _____no

12. Over the last year have you hidden betting slips, lottery tickets, gambling money, IOUs or other signs of betting or gambling from your partner, children or other important people in your life? _____yes _____no

13. Over the last year have you argued with people you live with over how you handle money? _____yes _____no

14. (If you answered yes to question 12): Have money arguments centered on your gambling? _____yes _____no

15. Have you borrowed from someone over the last year and not paid them back as a result of your gambling? _____yes _____no

16. Over the last year have you lost time from work (or school) due to betting money or gambling? _____yes _____no

17. If you borrowed money to gamble or to pay gambling debts, from whom or where did you borrow? (Check "yes" or "no" for each.)

a.	from household money	_____yes _____no
b.	from your partner	_____yes _____no
c.	from other relatives or in-laws	_____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	
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

HOW I FEEL ABOUT MYSELF

Using the 1-4 scale below, indicate the degree to which you feel that each item is characteristic of you by circling the appropriate number to the right of each item.

	Not at true			Very true
1. I feel that I am a person of worth, at least on an equal basis with others.	1	2	3	4
2. I feel that I have a number of good qualities.	1	2	3	4
3. All in all, I am inclined to feel that I am a failure.	1	2	3	4
4. I am able to do things as well as most other people.	1	2	3	4
5. I feel I do not have much to be proud of.	1	2	3	4
6. I take a positive attitude toward myself.	1	2	3	4
7. On the whole, I am satisfied with myself.	1	2	3	4
8. I wish I could have more respect for myself.	1	2	3	4
9. I certainly feel useless at times.	1	2	3	4
10. At times I think I am no good at all.	1	2	3	4

SELF-RATING DEPRESSION SCALE (SDS)

Below are twenty statements. Please rate each using the following scale:

1 = Some or a little of the time

2 = Some of the time

3 = Good part of the time

4 = Most or all of the time

1. I feel down-hearted, blue, and sad.	1	2	3	4
2. Morning is when I feel the best.	1	2	3	4
3. I have crying spells or feel like it.	1	2	3	4
4. I have trouble sleeping through the night.	1	2	3	4
5. I eat as much as I used to.	1	2	3	4
6. I enjoy looking at, talking to, and being with attractive women/men	1	2	3	4
7. I notice that I am losing weight.	1	2	3	4
8. I have trouble with constipation.	1	2	3	4
9. My heart beats faster than usual.	1	2	3	4
10. I get tired for no reason.	1	2	3	4
11. My mind is as clear as it used to be.	1	2	3	4
12. I find it easy to do the things I used to do.	1	2	3	4
13. I am restless and can't keep still.	1	2	3	4
14. I feel hopeful about the future.	1	2	3	4
15. I am more irritable than usual.	1	2	3	4
16. I find it easy to make decisions.	1	2	3	4
17. I feel that I am useful and needed.	1	2	3	4
18. My life is pretty full.	1	2	3	4
19. I feel that others would be better off if I were dead.	1	2	3	4
20. I still enjoy the things I used to do.	1	2	3	4

DEMOGRAPHIC QUESTIONNAIRE

The information you provide will be completely confidential.

1. **Age:** _____

2. **Gender:** Male____ Female____

3. **Income:** What was your individual annual income in the last year?_____
   If different, what was your household income? _____

5. **Highest Level of Education Completed:** _____

6. **Employment:**

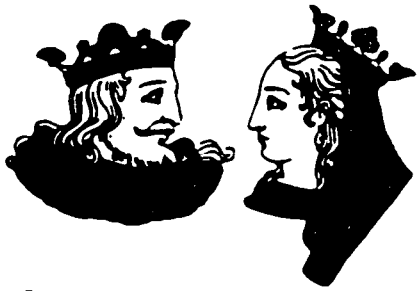
_____student
_____disability
_____employed
_____retired
_____family benefits
_____unemployed
_____homemaker

7. **Relationship Status:**

_____partnered
_____single
_____separated or divorced
_____widow/widower

APPENDIX B

Questionnaire used in Study 1



CASINO AMUSEMENTS CANADA

International Casino Agents Since 1974

July 09, 1999

Dear Valued Friend,

As you are probably aware, gambling is quickly becoming a very popular activity in Canada. Because of its popularity it is important to understand the social and psychological impact this activity could have on people's lives. For a large majority of the population, gambling is an exciting form of entertainment and few negative consequences from gambling are experienced. One interesting question is, how is it that most people gamble recreationally, while some develop severe problems. Researchers at the School of Psychology at the University of Ottawa are conducting research to try to answer this question. In order to do this they require volunteers who gamble to answer some questions concerning how people view themselves, their reasons for gambling, and their gambling behaviour.

I am sending out this questionnaire from my office asking for your assistance in this important study. Please take a few moments to read the instruction sheet. Should you decide to complete the enclosed questionnaire **your name will not be required** and **your answers will be anonymous and confidential**.

I would greatly appreciate if you would take the time to complete this questionnaire and return it to my office in the postage pre-paid envelope provided. This information is vital as the industry continues to grow in our province and across the country.

Thanks for taking a few moments to consider this request.

Sincerely yours,

Aubrey Zidenberg,
President

P.S. I currently sit on the Board of Directors of the Canadian Foundation on Complusive Gambling.

80 West Beaver Creek Road, Unit 17, Richmond Hill, Ontario L4B 1H3
Phone: (905) 731-5678 • Fax: (905) 731-3653 • Toll Free: 1-800-567-2121
A Division of 301373 Ontario Limited

Université d'Ottawa • University of Ottawa

École de psychologie School of Psychology

Instructions for Completing the Questionnaire Package

A study is presently being conducted a the University of Ottawa under the Direction of Dr. Luc Pelletier, School of Psychology, concerning the relationship between people's perceptions of themselves and their reasons for engaging in gambling activities. For a large majority of the population gambling is an exciting form of entertainment. Most people experience few negative consequences from gambling. However, for some, this activity is associated with an assortment of problems. We are interested in investigating factors that may influence whether gambling activity remains recreational or becomes problematic. You are part of a carefully selected sample, and your response is needed if the study is to be successful. We would be very grateful to have your participation in this research. Participation involves filling out a package of questionnaires.

You are under no obligation to participate in this research. Completion of these questionnaires is entirely voluntary. The decision to participate, or not, is yours.

In order to ensure anonymity, we ask that you do not put your name on the questionnaire. Nowhere in the package will you be asked to give your name, so your identity will remain unknown and your answers will be anonymous. The answers will be coded and combined with those of others who have participated. They will be analyzed as a group, rather than on an individual basis. In addition, answers will be kept confidential. No one other than the involved researchers will have access to your responses and these responses will be kept in a locked cabinet in Dr. Pelletier's research laboratory at the University of Ottawa. Only the collective results of the study will be presented in the final report. This report will be comprised of global information for the complete sample of subjects completing the questionnaires.

If you agree to participate in this study, your participation will involve completing this questionnaire package. While the time varies among people, the questionnaire takes about 30 minutes to complete. When answering the items, we ask that you try to answer them as accurately as possible. It is important to remember that these questionnaires are neither tests nor examinations. There are no right and wrong answers, we are simply interested in your honest opinions. Also, **we encourage you not to leave any items unanswered, but instead pick the response that best describes your thoughts and feelings for the item.** Of course, you are not obligated to answer any question you do not feel comfortable in responding to and you are free to withdraw from the study at any time without penalty. Should you have any questions concerning

145, rue Jean-Jacques-Lussier, C.P. 450, Succ. A
Ottawa (Ontario) K1N 6N5 Canada

(613) 562-5799 •

the questionnaires, please do not hesitate to telephone us at (613) 596-0772 or (613) 562-5800 (ext. 4201). Should you have concerns about your gambling activities the gambling help and referral hotline is 1-800-461-0140.

If you wish to receive a copy of the report on this study, you can contact us by phone or by mail at the phone number or the address indicated below (you can detach this page from the questionnaire and keep it if you decide to contact us later).

Please fill out the enclosed questionnaires if you wish to participate. We would like to extend our appreciation for your co-operation in this research project.

Sincerely,

Luc Pelletier, Ph.D. and Marilyn Keyes, M.A.
School of Psychology
University of Ottawa
145 Jean-Jacques Lussier St.
P.O. Box 450, Station A
Ottawa, Ontario K1N 6N5
(613) 562-5800 (ext. 4201) or (613) 596-0772

IMPORTANT: ***This questionnaire is two-sided. Please fill in both sides of each page.***

GENERAL ATTITUDES

In general, I do things

	Does not correspond			Corresponds moderately			Corresponds completely
1.....in order to help myself become the person I am to be	1	2	3	4	5	6	7
2.....because of the pleasure I feel as I become more and more skilled	1	2	3	4	5	6	7
3.....although I do not see the benefit in what I am doing	1	2	3	4	5	6	7
4.....because of the sense of well-being I feel while I am doing them	1	2	3	4	5	6	7
5....because I want to be viewed more positively by certain people	1	2	3	4	5	6	7
6....because I chose them as means to attain my objectives	1	2	3	4	5	6	7
7....for the pleasure of acquiring new knowledge	1	2	3	4	5	6	7
8....because otherwise I would feel guilty for not doing them	1	2	3	4	5	6	7
9....because by doing them I am living in line with my deepest principles	1	2	3	4	5	6	7
10...for the pleasure I feel mastering what I am doing	1	2	3	4	5	6	7
11...although it does not make a difference whether I do them or not	1	2	3	4	5	6	7
12...for the pleasant sensations I feel while I am doing them	1	2	3	4	5	6	7
13...in order to show others what I am capable of	1	2	3	4	5	6	7
14...because I chose them in order to attain what I desire	1	2	3	4	5	6	7
15...for the pleasure of learning new, interesting things	1	2	3	4	5	6	7
16...because I force myself to do them	1	2	3	4	5	6	7
17...because of the satisfaction I feel in trying to excel in what I do	1	2	3	4	5	6	7
18...even though I do not have a good reason for doing them	1	2	3	4	5	6	7

19...for the enjoyable feelings I experience	1	2	3	4	5	6	7
20...in order to attain prestige	1	2	3	4	5	6	7
21...for the pleasure of learning different interesting facts	1	2	3	4	5	6	7
22...because I would feel bad if I do not do them	1	2	3	4	5	6	7
23...because by doing them I am fully expressing my deepest values	1	2	3	4	5	6	7
24...because they reflect what I value most in life	1	2	3	4	5	6	7

LEISURE ACTIVITY SCALE

Indicate the leisure activities that you do most often, not including gambling, and to which you will refer throughout the questionnaire (e.g., reading, going out):

1. _____ 3. _____

2. _____ 4. _____

WHY DO YOU GENERALLY DO YOUR LEISURE ACTIVITIES?

With the help of the scale below, indicate to what degree each of the following items corresponds to one of the reasons for which you are presently doing your leisure activities.

	Does not correspond			Corresponds moderately			Corresponds completely
1. For the pleasure I feel in living exciting experiences.	1	2	3	4	5	6	7
2. Because I don't like to appear as someone who does nothing.	1	2	3	4	5	6	7
3. For the pleasure of knowing more about subjects that appeal to me.	1	2	3	4	5	6	7
4. Because it's one of the ways that I have chosen to make improvements on a personal level.	1	2	3	4	5	6	7
5. For the sense of freedom that I experience while doing the activity.	1	2	3	4	5	6	7

	Does not correspond			Corresponds moderately			Corresponds completely
6. I don't really know; I don't think that leisure activities suit me.	1	2	3	4	5	6	7
7. For the pleasure I feel when I outdo myself in interesting activities.	1	2	3	4	5	6	7
8. Because in life you absolutely need leisure activities to be happy.	1	2	3	4	5	6	7
9. Because sometimes it allows me to be appreciated by others.	1	2	3	4	5	6	7
10. Because it allows me to deepen my understanding of subjects that interest me.	1	2	3	4	5	6	7
11. Because it's the way I've chosen to acquire abilities in other areas that are important to me.	1	2	3	4	5	6	7
12. Because my leisure activities give me a real "high".	1	2	3	4	5	6	7
13. I don't really know; I have the impression that there isn't any activity that I could do very well.	1	2	3	4	5	6	7
14. For the pleasure of surpassing myself while doing activities that are challenging for me.	1	2	3	4	5	6	7
15. Because I absolutely must feel busy.	1	2	3	4	5	6	7
16. To show others that I am a dynamic person.	1	2	3	4	5	6	7
17. Because it allows me to explore many interesting domains.	1	2	3	4	5	6	7
18. Because doing leisure activities is one of the ways that allows me to develop other aspects of myself.	1	2	3	4	5	6	7
19. Honestly, I don't know; I have the impression that I'm wasting my time when I do leisure activities.	1	2	3	4	5	6	7
20. For the satisfaction I get while trying to master complex activities.	1	2	3	4	5	6	7
21. Because I absolutely must have my leisure time to be in a good mood.	1	2	3	4	5	6	7

HOW DO YOU FEEL WHEN YOU PRACTICE YOUR LEISURE ACTIVITIES?

Below are statements which deal with some aspects of your leisure activities. Using the 1-7 scale below, indicate your agreement by circling the appropriate number to the right of the item.

	Does not Correspond			Corresponds Moderately			Corresponds Exactly
1. I am usually tense when I engage in leisure activities.	1	2	3	4	5	6	7
2. I am distracted when I engage in leisure activities.	1	2	3	4	5	6	7
3. I'm generally happy when I engage in leisure activities.	1	2	3	4	5	6	7
4. I'm generally an anxious person.	1	2	3	4	5	6	7
5. I'm usually absorbed when I do leisure activities.	1	2	3	4	5	6	7
6. I am generally relaxed when I do leisure activities.	1	2	3	4	5	6	7
7. I experience a lot of freedom in my leisure activities.	1	2	3	4	5	6	7
8. I feel too controlled in my leisure activities.	1	2	3	4	5	6	7
9. I feel that what I do in my leisure activities is what I really want to do.	1	2	3	4	5	6	7
10. I am generally in a good mood when I do my leisure activities.	1	2	3	4	5	6	7
11. I feel that the various things that I work on when I do leisure activities are imposed on me rather than chosen by me.	1	2	3	4	5	6	7
12. During my leisure activities, I may sometimes think of something else.	1	2	3	4	5	6	7

SOUTH OAKS LEISURE ACTIVITIES SCREEN (SOLAS)

Please indicate the level of interest and involvement in the following activities. Circle a number for each activity.

	No interest at all	Moderate interest	Heavy interest	Obsessive interest
Watching television	1	2	3	4
Playing cards	1	2	3	4
Playing cards for money	1	2	3	4
Betting on sports	1	2	3	4
Betting horses	1	2	3	4
Playing the lottery or numbers	1	2	3	4
Playing dominoes or dice for money	1	2	3	4
Playing slot or video machines for money	1	2	3	4
Playing bingo for money	1	2	3	4
Gambling in casinos	1	2	3	4
Stocks, commodities, or options	1	2	3	4
Other gambling or betting activities (Please name_____)	1	2	3	4

ATTITUDES TOWARD GAMBLING

When you gamble, what game do you prefer? (Lotto, Blackjack, Bingo, Sports, etc.) _____

With the help of the items below please indicate to what point (on a scale of 1 to 7) each statement corresponds with the reasons you gamble at your favourite game.

Does not Correspond at all		Corresponds a little		Corresponds moderately		Corresponds a lot		Corresponds exactly
1	2		3	4	5		6	7

WHY DO YOU GAMBLE AT YOUR FAVOURITE GAME?

1. Because it's exciting to play with money.	1	2	3	4	5	6	7
2. For the pleasure I get when I improve my knowledge of the game.	1	2	3	4	5	6	7
3. For the feelings of efficacy I feel when I gamble.	1	2	3	4	5	6	7
4. Because it is the best way for me to relax completely.	1	2	3	4	5	6	7
5. Because it makes me feel like someone important.	1	2	3	4	5	6	7
6. I gamble to become rich.	1	2	3	4	5	6	7
7. I gamble, but sometimes I ask myself if I should continue gambling at my favourite game.	1	2	3	4	5	6	7
8. Because of the enormous rush I get.	1	2	3	4	5	6	7
9. For the satisfaction of learning new ways to gamble at my favourite game.	1	2	3	4	5	6	7
10. Because gambling permits me to test my self-control.	1	2	3	4	5	6	7
11. Because it is the best way I know to get rid of tension.	1	2	3	4	5	6	7
12. To show others that I am a dynamic person.	1	2	3	4	5	6	7
13. I gamble to buy something that I dream about.	1	2	3	4	5	6	7
14. I gamble, but sometimes I wonder what it does for me.	1	2	3	4	5	6	7
15. For the strong sensations I get when I gamble at my favourite game.	1	2	3	4	5	6	7

Does not Correspond at all 1	2	Corresponds a little 3	Corresponds moderately 4	5	Corresponds a lot 6	Corresponds exactly 7
16. Because I am curious about what can happen in the course of the game.	1	2	3	4	5	6	7
17. For the satisfaction I get when I can control the game.	1	2	3	4	5	6	7
18. Because it is the past time I choose to distract myself from my concerns.	1	2	3	4	5	6	7
19. So that others will envy me.	1	2	3	4	5	6	7
20. To make money quickly and easily.	1	2	3	4	5	6	7
21. I gamble, but sometimes I get the impression that I don't get much out of it.	1	2	3	4	5	6	7
22. I gamble for the thrill or strong sensations I experience.	1	2	3	4	5	6	7
23. For the pleasure of knowing my capabilities at this game.	1	2	3	4	5	6	7
24. For the feeling of control it gives me.	1	2	3	4	5	6	7
25. Because it is the best way I know of getting together with my friends.	1	2	3	4	5	6	7
26. Because I feel important when I win.	1	2	3	4	5	6	7
27. I gamble to make a little money.	1	2	3	4	5	6	7
28. I gamble, but sometimes I wonder if it's good for me.	1	2	3	4	5	6	7

SOUTH OAKS GAMBLING SCREEN

1. Please indicate which of the following types of gambling you have done in the last year. For each type, mark one answer: "Not at all", "Less than once a week", "Once a week or more".

	Not at all	Less than once a week	Once a week or more
Play cards for money	1	2	3
Bet on horses, dogs or other animals (Off Track Betting, the track or with a bookie)	1	2	3
Bet on sports (parlay cards, Pro-Line, with bookie)	1	2	3
Played dice games, including craps, over and under, or other dice	1	2	3
Went to casino (legal or otherwise)	1	2	3
Played the numbers or bet on lotteries	1	2	3
Played bingo	1	2	3
Played the stock and/or commodities market	1	2	3
Played slot machines, poker machines, or other gambling machines	1	2	3
Bowled, shot pool, played golf, or some other games of skill for money	1	2	3
Pull tabs or "paper" games other than lotteries	1	2	3
Bet on games such as backgammon or mah jong	1	2	3
Some for of gambling not listed above (Please specify)_____	1	2	3

2. What is the largest amount of money you have gambled in the last year within 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$1000 up to $10,000
_____ more than $10,000

3. What is the longest amount of time you have gambled in the last year within any one day?

_____ never have gambled
_____ 1 hour or less
_____ more than 1 hour up to 3
_____more than 3 hours up to 6
_____ more than 6 hours up to 9
_____ more than 9 hours up to 12
_____ more than 12 hours

4. Check which of the following people in your life has (or had) a gambling problem:

_____father _____mother _____brother or sister
_____grandparent _____my spouse or partner _____my child(ren)
_____another relative _____a friend or someone else important in my life

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

_____never _____most of the time I lost
_____some of the time (less than half the time I lost) _____every time I lost

6. Have you ever claimed to be winning money gambling in the last year, 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

7. Do you feel you have had a problem with betting money or gambling in the last year?

_____no
_____yes, in the past but not now
_____yes

8. Over the last year did you ever gamble more than you intended to? _____yes _____no

9. Over the last year have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true? _____yes _____no

10. Over the last year have you felt guilty about the way you gamble or what happens when you gamble? _____yes _____no

11. Over the last year have you felt like you would like to stop betting money or gambling but didn't think you could? _____yes _____no

12. Over the last year have you hidden betting slips, lottery tickets, gambling money, IOUs or other signs of betting or gambling from your partner, children or other important people in your life? _____yes _____no

13. Over the last year have you argued with people you live with over how you handle money? _____yes _____no

14. (If you answered yes to question 12): Have money arguments centered on your gambling? _____yes _____no

15. Have you borrowed from someone over the last year and not paid them back as a result of your gambling? _____yes _____no

16. Over the last year have you lost time from work (or school) due to betting money or gambling? _____yes _____no

17. If you borrowed money to gamble or to pay gambling debts, from whom or where did you borrow? (Check "yes" or "no" for each.)

a.	from household money	_____yes	_____no
b.	from your partner	_____yes	_____no
c.	from other relatives or in-laws	_____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		
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

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 for that item. Please be open and honest in your responding. The 7-point scale is

Strongly Agree	Disagree	Slightly Agree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

1.	In most ways my life is close to my ideal	1	2	3	4	5	6	7
2.	The conditions of my life are excellent	1	2	3	4	5	6	7
3.	I am satisfied with my life	1	2	3	4	5	6	7
4.	So far I have gotten the important things I want in life.	1	2	3	4	5	6	7
5.	If I could live my life over, I would change almost nothing.	1	2	3	4	5	6	7

HOW I FEEL

Below is a list of the ways you might have felt or behaved recently. Please indicate how often you have felt this way during the past week.

1 = Rarely or none of the time (less than 1 day)
2 = Some or a little of the time (1-2 days)
3 = Occasionally or a moderate amount of time (3-4 days)
4 = Most or all of the time (5-7 days)

During the past week:

1.	I was bothered by things that usually don't bother me.	1	2	3	4
2.	I did not feel like eating: my appetite was poor.	1	2	3	4
3.	I felt that I could not shake off the blues even with help from my family or friends	1	2	3	4
4.	I felt that I was just as good as other people.	1	2	3	4
5.	I had trouble keeping my mind on what I was doing.	1	2	3	4
6.	I felt depressed.	1	2	3	4
7.	I felt that everything I did was an effort.	1	2	3	4
8.	I felt hopeful about the future.	1	2	3	4

9.	I thought my life had been a failure.	1	2	3	4
10.	I felt fearful.	1	2	3	4
11.	My sleep was restless.	1	2	3	4
12.	I was happy.	1	2	3	4
13.	I talked less than usual.	1	2	3	4
14.	I felt lonely.	1	2	3	4
15.	People were unfriendly.	1	2	3	4
16.	I enjoyed life.	1	2	3	4
17.	I had crying spells.	1	2	3	4
18.	I felt sad.	1	2	3	4
19.	I feel that others would be better off if I were dead.	1	2	3	4
20.	I could not get "going".	1	2	3	4

SELF-PERCEPTION

Using the 1-4 scale below, indicate the degree to which you feel that each item is characteristic of you by circling the appropriate number to the right of each item.

		Not at true			Very true
1.	I feel that I am a person of worth, at least on an equal basis with others.	1	2	3	4
2.	I feel that I have a number of good qualities.	1	2	3	4
3.	All in all, I am inclined to feel that I am a failure.	1	2	3	4
4.	I am able to do things as well as most other people.	1	2	3	4
5.	I feel I do not have much to be proud of.	1	2	3	4
6.	I take a positive attitude toward myself.	1	2	3	4
7.	On the whole, I am satisfied with myself.	1	2	3	4
8.	I wish I could have more respect for myself.	1	2	3	4
9.	I certainly feel useless at times.	1	2	3	4
10.	At times I think I am no good at all.	1	2	3	4

Demographic Questionnaire

The information you provide will be completely confidential.

1. **Age:** _____

2. **Gender**: Male____ Female____

3. **Income**: What was your individual annual income in the last year?_____
   If different, what was your household income? _____

5. **What is the highest grade (or year) of secondary (high school) or elementary school you have ever attended?**

   _____ Enter number (1 to 13) of grades or years

   How many years of education have you completed at university?

   _____ None
   _____ Less than one year
   _____ Enter number of completed years at university

   How many years of schooling have you ever completed at an institution other than a university, a secondary (high) school or an elementary school?

   _____ None
   _____ Less than one year
   _____ Enter number of completed years at community colleges, trade schools, CEGEPs, etc.

6. **Employment**:

   _____student
   _____disability
   _____employed
   _____retired
   _____family benefits
   _____unemployed
   _____homemaker

7. **Relationship Status**:

   _____partnered
   _____single
   _____separated or divorced
   _____widow/widower