AN EXAMINATION OF THE INFLUENCE OF FAMILIAL, EMOTIONAL, CONDUCT, AND COGNITIVE PROBLEMS, AND HYPERACTIVITY UPON YOUTH RISK-TAKING AND ADOLESCENT GAMBLING PROBLEMS

Report to the Ontario Problem Gambling Research Centre

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This research was supported by a grant to Drs. Derevensky and Gupta by the Ontario Problem Gambling Research Centre.

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ACKNOWLEDGEMENTS

We would like to thank the following school boards in Ontario who approved the study and allowed us access to their schools: Dufferin Peel Catholic District School Board, Durham Catholic District School Board, Grand Erie District School Board, London Catholic District School Board, Niagara Catholic District School Board, Thames Valley District School Board, Toronto District School Board, and Upper Canada District School Board. We are grateful to all the students who participated in this project, their teachers, and the administrative staff within all the schools who so graciously gave of their time and permitted the completion of this project. We would also like to thank Erin Beettam for providing invaluable help to the senior author in scheduling, data collection, and data entry, Kirsten Boehm for her assistance in formatting the document, and all the research assistants who collected data at the various sites.

The authors acknowledge the Ontario Problem Gambling Research Centre (OPGRC) for its funding of this project. The research findings, results, interpretations, conclusions, recommendations, and views expressed in this report are those solely of the authors and are not necessarily those of the OPGRC.

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EXECUTIVE SUMMARY

The current report presents the results of a study which empirically examined the relationship between several risk and protective variables associated with adolescent gambling. More specifically, the relationship between familial, emotional, social, and behavioral variables and youth gambling problems was investigated. Another purpose of the current study was to identify several risk factors that may be related to youth problem gambling. The sample consisted of 2,336 students, ages 11-19, from 34 elementary and high schools in the Province of Ontario. Participants completed a questionnaire regarding their gambling activities, gambling involvement, perceived social support, academic performance, drug and alcohol dependence, and various social, emotional, cognitive, behavioral and attentional problems. The results of this research program are intended to provide valuable information for the development of successful risk reduction prevention programs for youth.

Findings

- Overall, 66% of youth in grades 7 to 13 (ages 11-19) reported gambling within the past year (77.2% males, 58.8% females), with 20% of youth engaging in such activities on a regular basis (28.0% males; 11.4% females). It is important to note that the legal age for gambling in the Province of Ontario is 18 for the lottery and 19 for all other forms of province sponsored and legalized forms of gambling.

- With respect to gambling severity, 33.3% of participants were Non Gamblers, 53.8% were Social Gamblers, 8.0% were At-Risk Gamblers, and 4.9% were Probable Pathological Gamblers.

- Males gamble significantly more than females and appear to be 5 times more likely to be classified as probable pathological gamblers (males 9.1%; females 1.7%) and 3 times more likely to be classified as at-risk gamblers (males 11.8%; females 4.8%).

- Probable pathological gambling was found to be lowest in grade 7 (2.8%), remains relatively steady in grades 8 through 12 (4.6%-5.0%), and jumps significantly in grade 13 (7.3%). The same pattern was observed for the at-risk gambling group. It should be noted that grade 13 students are approximately 18 years of age (M = 17.95, SD = 0.53) and are legally permitted to gamble on the lottery (scratch tickets, sports betting, and draws) but not casino or slot machine wagering in Ontario.

- Males reported engaging in all activities significantly more than females, with the exception of occasional lottery play (females 29.1%; males 24.4%), occasional bingo (females 20.0%, males 19.4%), regular bingo (females 2.2%; males 2.3%), and regular internet gambling with money (females 0.5%; males 0.6%).

- The most popular activities that participants engaged in on a regular basis (once a week or more) included cards (6.6%), followed by sports pools (4.6%), games of skill (4.3%), and the lottery (lottery draws and scratch cards) (4.2%).

- The preferred gambling activities for both probable pathological gamblers and at-risk gamblers were found to be cards, sports pools, games of skill, sports lottery, and scratch and draw lottery.

- Internet participation in gambling type games *without* money was found to be a very popular activity for males in general (9.4%) and among the at-risk (20.4%) and probable pathological gamblers (25.0%), significantly more so than internet gambling for money (3.7%, 2.7%, and 4.5% respectively).

- Probable pathological and at-risk gamblers reported perceiving significantly more family members and peers as having a gambling problem than non gamblers and social gamblers. Probable pathological gamblers reported more fathers/stepfathers (13.3%), and other relatives (25.7%), with gambling problems compared to at-risk gamblers (9.7% and 18.8% respectively). With respect to peers, classmates, and significant other individuals in the participants' lives, a linear trend was observed, with probable pathological gamblers reporting a greater percentage of friends, classmates, and others who have gambling problems.

- Probable pathological and at-risk gamblers reported perceiving significantly more family members and peers as having a drug and/or alcohol problem. More specifically, probable pathological gamblers reported significantly more father/stepfathers (22.1%), brothers (19.5%), and other relatives (35.4%), with reported substance use problems than at-risk gamblers (15.6%, 8.1%, and 25.3% respectively). With respect to peers, probable pathological gamblers reported significantly more friends and classmates with substance use problems.

- The percentage of youth reporting close confidantes significantly decreased as gambling severity increased. For example, 88.5% of non gamblers and 89.8% of social gamblers report having confidantes with whom to discuss problems compared to 82.1% of at-risk gamblers and 80% of probable pathological gamblers. Probable pathological gamblers report having significantly fewer friends and parents as confidantes compared to non gamblers and social gamblers. This is interesting considering that probable pathological gamblers also reported having significantly more friends (6 or more) than other youth.

- A significantly greater percentage of probable pathological gamblers reported having been diagnosed with a learning disability (22.3%), and classified themselves as slow learners (16.8%) compared to non gamblers (9.4% and 8.3% respectively) and social gamblers (7.8% and 5.9% respectively), but not at-risk gamblers (15.8% and 12.4% respectively). Furthermore, a lower percentage of at-risk (66.7%) and probable pathological gamblers (54.9%) reported they do well in school in contrast to non gamblers (84.7%) and social gamblers (81.9%). Consistent with these findings, probable pathological gamblers reported significantly lower overall grade averages than the other students.

- Regarding social, emotional, and behavioral problems as assessed by the CASS:L, a significantly greater percentage of probable pathological gamblers obtained clinical levels of these types of difficulties. Linear trends were observed with respect to symptoms increasing with level of gambling severity.

- Probable pathological gamblers (49.5%) and at-risk (30.1%) gamblers reported having more familial problems in contrast to social (18.0%) and non gamblers (15.1%).

- A greater percentage of probable pathological gamblers (41.6%) and at-risk (31.7%) gamblers had scores in the clinical range assessing emotional problems compared to social (19.0%) and non gamblers (17.2%).

- Probable pathological gamblers (42.5%) and at-risk (27.4%) gamblers reported significantly more cognitive problems than social (16.9%) and non gamblers (13.6%).

- A large percentage of probable pathological gamblers (70.8%) and at-risk gamblers (45.7%) reached clinical levels of conduct problems in contrast to social (22.5%) and non gamblers (12.0%).

- Probable pathological gamblers yielded significantly higher ADHD scores falling in the clinical range. Linear trends were observed with respect to symptoms increasing with level of gambling severity. More specifically, probable pathological gamblers (29.2%) reported more clinical symptoms related to hyperactivity compared to at-risk (18.8%), social (13.3%), and non gamblers (13.3%). More probable pathological gamblers (49.6%) had scores in the clinical range on the ADHD Index subscale than at-risk (31.7%), social (18.2%) and non gamblers (12.7%).

- A significantly greater percentage of probable pathological gamblers (53.9%) reported clinical levels of DSM symptomatology (Inattentive & Hyperactive Impulsive subtypes) in contrast to at-risk (32.8%), social (21.2%), and non gamblers (11.9%).

- Social gamblers had significantly higher mean scores on the PSS Friend scale than at-risk gamblers whereas non gamblers and social gamblers had higher mean scores on the PSS Family scale than at-risk and probable pathological gamblers.

- As gambling severity increases, so does problematic involvement with drugs and alcohol. A significantly greater percentage of probable pathological gamblers (50.9%) were found to be at greatest risk for the development of chemical dependency problems (31.9% at-risk, 15.4% social, 7.7% non gamblers). Probable pathological gamblers were also found to use alcohol and marijuana more frequently than at-risk, social, and non gamblers.

- The current study identified a set of predictor variables which lead to problem gambling (at-risk and probable pathological). These include having family problems, conduct problems, substance abuse (drugs or alcohol), and being male.

Future Directions

The results of the current study have identified a multitude of self-reported problems experienced by problem gamblers. These risk factors for problem gambling include academic problems, poor perceived familial and peer social support, cognitive problems, emotional problems, substance use problems, conduct problems, family problems, parental involvement in gambling and substances, ADHD and ADHD related symptoms, particularly inattention. The magnitude of problems and psychopathology that are reported by probable pathological gamblers and at-risk problem gamblers demonstrates that these individuals are experiencing multiple difficulties and are likely using their gambling as an ineffective coping strategy to escape their problems. Moreover, the current study has enabled the identification of a set of predictor variables which lead to problem gambling. These include having family problems, conduct problems, being addicted to drugs or alcohol, and being male. When developing prevention programs and awareness campaigns, particular attention should be paid to these youth.

Longitudinal research is the next step in the identification and confirmation of risk and protective factors contributing to the development of youth gambling. Longitudinal research provides the advantage of being able to follow the same individual over time in order to gain an understanding of the variables at play in youth gambling, and will provide a better understanding of the long-term course and consequences of problem gambling.

Additional research designed to identify protective factors for youth gambling problems is greatly needed. Such information would be invaluable for the development of risk reduction prevention programs and awareness campaigns.

INTRODUCTION

While prior research has identified several predisposing variables that may place certain youth at heightened risk for the development of a serious gambling problem, our current state of knowledge remains incomplete. There is ample evidence that a relatively large percentage of children and adolescents are engaging in gambling activities in spite of legal, and to some extent, parental restrictions (Derevensky & Gupta, 2000b; Govoni, Rupcich, & Frisch, 1996; Gupta & Derevensky, 1998a; National Opinion Research Center (NORC), 1999; National Research Council (NRC), 1999; Wiebe, 1999; Wynne, Smith, & Jacobs, 1996). The results of a large Harvard University meta-analysis indicate that between 4-8% of adolescents currently exhibit a serious gambling problem with another 10-14% of adolescents at-risk for developing a gambling problem (Shaffer & Hall, 1996). The National Research Council concluded that "most adolescents not only gamble, but also have gambled fairly recently" (NRC, 1999). Other research further indicates that more adolescents are gambling than engaging in other potentially addictive behaviors (e.g., smoking, alcohol, and drug consumption) (Gupta & Derevensky, 1998b), a finding corroborated by the NRC (1999) in their analysis of several adolescent studies in which gambling, alcohol, and drug use were assessed.

Knowledge acquired from research efforts have been complimented with clinical information obtained from youth treated at the McGill University Youth Gambling Research and Treatment Clinic. A combination of these experiences has enabled the identification of a constellation of psychosocial variables that likely contribute to the development and maintenance of risk-taking behaviors in youth (Hardoon & Derevensky, 2002). Nevertheless, there appears to be a lack of empirical research supporting the relationship between several emotional, social, and behavioral variables associated with risk behaviors and youth gambling problems, with past research being primarily based upon parental and teacher reports as well as retrospective reports from adult pathological gamblers.

BACKGROUND LITERATURE

The last few decades have seen a remarkable regeneration of theoretical and empirical work on adolescent risk behavior. Risk behaviors, those behaviors which directly or indirectly compromise the well-being, health, and life course of youth, have become of paramount concern to researchers and clinicians. Early research in the area of risky behaviors focused primarily upon illegal or deviant behaviors that generally resulted in some type of social sanction (Jessor, 1991). These behaviors have traditionally included delinquency, substance use and abuse, and early sexual activity. More recently, the concept of risk behavior has expanded to include tobacco use, risky driving, and excessive gambling behaviors. In addition, research in this area has begun to explore the organization, structure, and covariation of risk behaviors, rather than approaching them as isolated factors. Moreover, there has been a shift from single variable explanations of risk (e.g., low self-esteem or the absence of positive models) to multiple variable causes that take into account the individual, the environment, and their interaction. Risk behaviors can best be viewed as risk factors for personally, socially, or developmentally undesirable outcomes. According to Jessor (1991), the research goals are twofold: (1) understanding the processes that link risk behaviors to adverse outcomes; and (2) understanding why an adolescent initially engages in a particular risk behavior. Despite the relative paucity of research focused on youth gambling, there is a growing research movement focusing on achieving these goals.

Youth Gambling and Related Literature

Today's youth are growing up in a time where gambling is both legalized and widely available. All U.S. states (except Hawaii, Tennessee, and Utah), Canadian provinces, and approximately 90 countries worldwide have legalized gambling (Azmier, 2000; Lesieur & Rosenthal, 1991; NORC, 1999; Stinchfield & Winters, 1998). One of the primary reasons that gambling is so prevalent among today's youth is its high level of social acceptance by both youth and adults (Abbott, 2001; Azmier, 2000). Gambling is advertised widely, easily accessible to youth, often found in environments and places that are glamorous and exciting (e.g., bars, casinos), and provides opportunities for socializing, be it positive or negative (Stinchfield & Winters, 1998). Although wagering in casinos, on electronic gaming machines, and lotteries, in general, are illegal for adolescents in most jurisdictions, the enforcement of these laws, as with underage drinking is becoming increasingly difficult (Moore & Ohtsuka, 1997).

Gambling is viewed by youth as a relatively benign activity which is significantly less harmful than alcohol, drugs, or cigarettes (Gupta, Derevensky, & Hardoon, 2001). A large-scale survey examining adult Canadian gambling behavior and attitudes revealed that gambling is perceived to be an acceptable activity as well as a personal right (Azmier, 2000). Still further, the vast majority of adults surveyed did not consider gambling to be as serious a social problem as other risk behaviors, including drug or alcohol addiction, smoking, and reckless driving (Azmier, 2000). Similar attitudes were reported by Abbott (2001) in a survey conducted in New Zealand. However, he noted that while the findings suggest a steady increase in public awareness about problem gambling, the majority of adults currently consider this an issue of *some* concern to them. Nonetheless, combined with the primarily positive societal attitudes towards gambling and

the widespread social acceptability of these activities, the proliferation of gambling venues worldwide continues to increase. Adults' positive attitudes toward gambling are providing a message to their children that gambling is an acceptable form of entertainment and pastime. While the social costs of youth gambling have not been considered, excessive, compulsive gambling has been shown to cause personal and financial difficulties in at least 1-2% of the adult population in various countries throughout the world (Ladouceur & Walker, 1996) and remains a significant social and financial burden on society (Ladouceur, Boisvert, Pépin, Loranger, & Sylvain, 1994; Lesieur, 1998; NORC, 1999; NRC, 1999).

Gambling involves risk-taking, may involve some skill, and may best be conceptualized on a continuum ranging from non-gambling, to social and recreational gambling, to problem gambling, and to pathological gambling (NRC, 1999). Pathological gambling is characterized by a continuous or periodic loss of control over gambling, a preoccupation with gambling and obtaining money with which to gamble, irrational thinking, and a continuation of the gambling behavior despite adverse consequences (American Psychiatric Association (APA), 1994). Korn and Shaffer (1999) have proposed a public health concept of healthy and unhealthy gambling which can be seen in Figure 1. In this model, healthy gambling represents informed choice on the probability of winning (e.g., gambling for pleasure with reasonable amounts of money). According to their model, healthy gambling sustains or enhances a gamblers' state of well-being. In contrast, unhealthy gambling includes the gambling-related problems that are experienced by gamblers which in turn result in adverse consequences.

Figure 1. Gambling and Health [Reproduced from Korn & Shaffer (1999)].

It should be noted that adolescents who engage in excessive gambling and experience serious gambling-related problems are often referred to as *probable pathological gamblers*. This nomenclature is used at this time as there is controversy as to whether adolescents can, in fact, be *pathological gamblers*, as well as notion that adolescent gambling screens are not diagnostic (screens for possible pathological gambling would not qualify as a diagnosis of pathological gambling) (Derevensky, Gupta, & Winters, 2002).

Prevalence

There is ample evidence that gambling is an extremely popular activity for children and adolescents (Derevensky & Gupta, 2000a; Govoni et al., 1996; Gupta & Derevensky, 1998a; Hardoon & Derevensky, 2002; Jacobs, 2000; NRC, 1999; Volberg, 1998; Wiebe, 1999). Findings indicate that adolescent problem gambling rates are more than double those of adults (Derevensky & Gupta, 2000b; Gupta & Derevensky, 1998a; Jacobs, 2000; Lesieur, Cross, Frank, Welch, White, Rubenstein, Moseley, & Mark, 1991; NRC, 1999; Shaffer & Korn, 2002; Wynne, Smith, & Jacobs, 1996). A meta-analytic study examining rates of adolescent pathological gambling, synthesized from data derived from 146 prevalence studies conducted in Canada and the United States (Shaffer & Hall, 2001), found similar results as earlier meta-analyses and studies which indicated that between 4-8% of adolescents exhibit seriously adverse compulsive or pathological patterns of gambling activity (Derevensky & Gupta, 2000b; Fisher, 1993; Gupta & Derevensky, 1998a; Jacobs, 2000; Shaffer & Hall, 1996; Shaffer & Korn, 2002; Shaffer, LaBrie, Scanlan, & Cummings, 1994; Winters, Stinchfield, & Fulkerson, 1993; Wynne et al., 1996) while 10-15% of adolescents are at risk for developing or returning to serious gambling problems (Shaffer & Hall, 1996). More recently, in the Province of Ontario, prevalence rates of adolescent probable pathological gambling were found to be slightly lower, 2.8% (Felsher, Derevensky, & Gupta, 2001; Kaufman, Derevensky, & Gupta, 2001). The reduced rates may be attributed to the use of a more conservative problem gambling screen (DSM-IV-MR-J).

A large majority of adolescents report engaging in both legal and illegal forms of gambling activities. Between 39-92% (median = 85%) adolescents in the U.S. report having gambled during their lifetimes (NRC, 1999). Jacobs (2000) has suggested that within the past year, two thirds of legally underage youth have gambled for money. In the U.S. and Canada, this accounts for approximately 15.3 million, 12-17 year olds, while 2.2 million are reported to be experiencing serious gambling related problems. Trends between 1984 and 1999 indicate a significant increase in the proportion of youth who report gambling within the past year and those who report gambling related problems (Jacobs, 2000). Lifetime rates of adolescent gambling range between 80-90% (Gupta & Derevensky, 1998a; Ladouceur, Dubé, & Bujold, 1994a) while 22-35% gamble once a week or more (Derevensky, Gupta & Della-Cioppa, 1996; Gupta & Derevensky, 1998a). Similar rates were reported in recent studies in the Province of Ontario, where lifetime rates range between 60-75% and weekly rates were 20-25% (Felsher et al., 2001; Kaufman et al., 2001).

Increases in child and adolescent involvement in gambling activities are not exclusive to North America. In the U.K., studies reveal between 40-81% of adolescents played fruit machines, with 5-18% playing weekly (Fisher, 1993; Griffiths, 1991; Huxley & Caroll, 1992; Ide-Smith & Lea, 1988).

Of equal concern is the age at which they are introduced to such activities. Adolescent probable pathological gamblers report beginning gambling at 9 or 10 years of age (Gupta & Derevensky, 1998a; Jacobs, 2000; Kaufman et al., 2001; Wynne et al., 1996) while adult problem gamblers report that their pathological behaviors began in late childhood and adolescence (Custer, 1982; Dell, Ruzicka, & Palisi, 1981). Additional confirmation comes from studies by Gupta and

Derevensky (1996) and Ladouceur, Dubé, and Bujold (1994b).

The Acquisition and Maintenance of Risk Behavior

Risk Factors and Correlates of Problem Gambling

The following section provides a brief overview of our current state of knowledge on the risk factors and correlates of adolescent problem gambling.

Gender. Despite some inconsistent findings, much of the literature suggests that gambling is more popular amongst adolescent males than females (Derevensky & Gupta, 2000a, 2000b; Govoni et al., 1996; Jacobs, 2000; Ladouceur et al., 1994a, 1994b; Stinchfield, 2000). Pathological gambling is twice as prevalent among males as females (Lesieur et al., 1991; Lesieur & Klein, 1987; Moore & Ohtsuka, 1997; Stinchfield, 2000; Stinchfield & Winters, 1998; Volberg, 1994). Males have been found to make higher gross wagers and exhibit greater risk-taking behavior (Derevensky et al., 1996), to gamble earlier, gamble on more games, gamble more often, spend more time and money, and experience more gambling-related problems than female youth (Jacobs, 2000). Research has shown that females prefer scratch tickets and lotteries, whereas males prefer sports betting and card games (Derevensky et al., 1996; Felsher et al., 2001; Govoni et al., 1996; Griffiths, 1989; Gupta & Derevensky, 1998a; Jacobs, 2000; Ladouceur et al., 1994a; NORC, 1999; NRC, 1999; Stinchfield, 2000; Stinchfield, Cassuto, Winters, & Latimer, 1997; Volberg, 1994, 1996, 1998; Wynne et al., 1996).

Physiological factors. Adolescent probable pathological gamblers have been found to have increased physiological resting states, to have a greater need for sensation seeking, are more likely to be aroused and excited during gambling (Gupta & Derevensky, 1998a) and have been found to dissociate more frequently when gambling (Gupta & Derevensky, 1998b; Hardoon, Baboushkin, Powell, & Gupta, 1997; Kaufman et al., 2001; Jacobs, Marston & Singer, 1985).

Personality factors. Research indicates that adolescent probable pathological gamblers are greater risk-takers (Arnett, 1994; Gupta & Derevensky, in press; Nower, Derevensky & Gupta, 2000; Powell, Hardoon, Derevensky, & Gupta, 1999; Zuckerman, 1979, 1994; Zuckerman, Eysenck, & Eysenck, 1978), score higher on measures of impulsivity (Gupta & Derevensky, 1997; Zimmerman, Meeland, & Krug, 1985), excitability, extroversion, and state and trait anxiety (Blaszczynski & McConaghy, 1989; Ste-Marie, 2001), and lower on measures of conformity and self-discipline (Gupta & Derevensky, 1997, 1998a, in press; Vitaro, Ferland, Jacques & Ladouceur, in press). Problem and pathological gamblers have also been found to be more self-blaming, guilt prone, anxious, and less emotionally stable (Gupta & Derevensky, 2000).

Emotional factors. Problem gamblers have been found to have lower self-esteem (Gupta & Derevensky, 1998b), higher rates of depression (Gupta & Derevensky, 1998a, 1998b; Getty, Watson, & Frisch, 2000; Kaufman et al., 2001; Marget, Gupta & Derevensky, 1999; Nower et al., 2000), and to report greater suicide ideation and suicide attempts (Gupta & Derevensky, 1998a; Ladouceur et al., 1994a; Lesieur et al., 1991).

Coping. Adolescents with gambling problems have been found to have poor/maladaptive general coping skills (Getty et al., 2000; Marget et al., 1999; Nower et al., 2000). More specifically, problem and pathological gamblers have been found to use more emotion and distraction oriented coping styles than non gamblers (Kaufman et al., 2001).

Problem behaviors. Adolescent probable pathological gamblers often have a history of delinquency (Ladouceur et al., 1994a; Maden, Swinton, & Gunn, 1992; Omnifacts Research Ltd., 1993; Stinchfield, 2000; Winters et al., 1993) and are also more likely to have had difficulty in school, including increased truancy and poor grades (Lesieur et al., 1991; Wallisch, 1993). While adolescents with gambling problems report having a support group, old friends are often replaced by gambling associates (Gupta & Derevensky, 2000). Problem and pathological gambling has been shown to result in increased delinquency and crime, disruption of familial relationships and decreased academic performance (Gupta & Derevensky, 1998a; Ladouceur & Mireault, 1988; Lesieur & Klein, 1987; Wynne et al., 1996). They are often preoccupied with their gambling, lying to their family and friends, and trying to obtain money to gamble (Derevensky & Gupta, 2000a; Gupta & Derevensky 2000).

Gambling behavior. Adolescent and young adult problem gamblers report consistently chasing their losses (e.g., return to win back money lost) (Breen & Zuckerman, 1999). They have also been found to exhibit erroneous perceptions during gambling (e.g., they feel that they can predict the outcome of the game) (Breen & Zuckerman, 1996; Derevensky & Gupta, 2000a; Fisher, 1993). Many youth problem gamblers report having had very early gambling experiences and/or an early big win (Griffiths, 1995; Gupta & Derevensky, 1997; Wynne et al., 1996).

Attitudes. Gambling is viewed positively as an attractive and benign activity which is significantly less harmful than alcohol, drugs, or cigarettes (Gupta et al., 2001) with very few children fearing getting caught while gambling (Derevensky & Gupta, 2000a; Griffiths & Wood, 2000). Research has indicated that adolescent attitudes and behavior have been shown to predict gambling behavior in later adulthood (Griffiths & Wood, 2000).

Accessibility. Greater accessibility has been reported to be related to a corresponding increase in gambling, increased money spent on gambling, and an increase in the number of problem gamblers (Griffiths, 1995; Jacobs, 2000).

Familial factors. Adolescent pathological gamblers report that their initial gambling experiences took place with family members in their own homes (Gupta & Derevensky, 1997) and with siblings appearing to be an early predominant influence. As children get older, they gamble less with their family and more with friends. Pathological gamblers are more likely to have parents with an addiction or parents who have been involved in illegal activities (Browne & Brown, 1993; Fisher, 1993; Griffiths, 1995; Gupta & Derevensky, 1998a; Ide-Smith & Lea, 1988; Wood & Griffiths, 1998).

Peer factors. Griffiths (1990) reported that 44% of adolescents participated in gambling activities because their friends were engaging in similar practices. As children get older they tend to gamble more with friends in their homes (Derevensky, Gupta, & Émond, 1995; Gupta &

Derevensky, 1996; 1997; Ide-Smith & Lea, 1988). A recent study by Hardoon and Derevensky (2001) reported that children in grades 4 and 6 who played a computer simulated game of roulette, individually and in groups, demonstrated changes in their playing behaviors as a result of peer modeling, suggesting a strong social learning component involved in the acquisition of such behaviors.

Based upon the available evidence, it appears that biological, environmental, and psychological processes interact in the etiology of gambling and problem gambling behavior. Blaszczynski (2000) has recently argued that all models of problem or pathological gamblers should incorporate biological, personality, developmental, cognitive, learning, and environmental factors. However, to date, the literature has kept these areas relatively distinct (for more comprehensive theoretical reviews see Rugle, Derevensky, Gupta, Winters, & Stinchfield, 2001; Wildman, 1997).

A Framework for Gambling

Risk and Protective Factors

The study of risk and protective factors has become an important component of research aimed at understanding the course of adaptive and maladaptive behavior. The concepts of risk, protective factors, and vulnerability have exerted a powerful influence on the study of epidemiology, psychology, and psychopathology (Masten & Garmezy, 1990).

The presence of risk factors is associated with an increased probability of negative or undesirable outcomes (e.g., the development of a disorder, morbidity, behaviors that can compromise health, well-being, or social performance). Such factors are generally associated with higher rates of problems. Research on the application of risk factors to psychopathology has generated individual, familial, and environmental variables associated with risk. Individual factors include gender, demographic variables, social and intellectual skills, genetic history, biochemical defects, and potential biological and chemical markers. Environmental factors have included stressful life events, residential area, mobility patterns, familial and cultural characteristics, and social supports (Masten & Garmezy, 1990).

Interest in protective factors has emerged from observations of children who were exposed to risk for psychopathology but escaped its influence. These observations led Garmezy and others (Garmezy, 1985; Rutter, 1987; Werner, 1989) to identify variables that might be protective factors (i.e., moderate, buffer, or insulate against risk). This new interest in protective factors promoted the investigation of individual differences in outcome measures, in which exposure to risk was essentially held constant. Early research on protective factors focused on its effects on psychopathology. However, more recently, research has been conducted on the likelihood of protective factors buffering the impact of risk for adolescent drug and alcohol abuse (Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995). Such protective factors have been found to include bonding to conventional society, supportive relationships with parents, high religiosity and law abidance, and self-efficacy in social relations (Jessor et al., 1995).

Protective factors include both individual and environmental characteristics or events and have often been termed to be the positive counterpart to risk factors. Like risk factors, protective factors include individual and environmental characteristics or events. Protective factors have been classified into three categories: (1) temperament of the child, (2) affectionate and emotionally supportive family environment, and (3) the presence of extended support systems (Garmezy, 1985). Recurring themes across research on protective factors include the importance of close relations with supportive adults, effective schools, and connections with competent, prosocial adults in the community (Luthar, Cicchetti, & Becker, 2000).

Rutter (1987) has argued that protective factors and risk factors should be treated as conceptually distinct rather than as opposite ends of a single dimension. This view is shared by several researchers in this area (e.g., Jessor, 1991; Luthar & Zigler, 1991). Within this perspective, protective factors are considered independent variables that can have their own direct effects upon behavior, but can also moderate the relationship between risk factors and behavior (Jessor et al., 1995). Protective factors reduce the probability of engaging in problem behaviors in several ways; via direct personal or social controls against its occurrence (e.g., strong religious commitment or parental sanctions); through involvement in activities that are incompatible with (or alternatives to) problem behavior (e.g., activities with family or religious groups); and by way of commitments to conventional institutions (e.g., school) or society (Jessor et al., 1995). In contrast, risk factors are conceptualized as increasing the probability of engaging in problem behaviors. This occurs through direct initiation or encouragement (e.g., lacking the resources to cope with difficulty or modeling and influence from peers); by way of increased vulnerability (e.g., low self-esteem); and via greater accessibility and opportunity to engage in problem behavior (e.g., antisocial peer group) (Jessor et al., 1995).

Protective factors not only serve to decrease the likelihood of the occurrence of problem behaviors, they also serve as moderators. In this capacity, they modify the relationship between risk and problem behaviors. This connection can be conceptualized as an interaction between risk and protection in relation to adolescent participation in problem behavior (Jessor et al., 1995).

With respect to gambling behavior, several risk factors were previously outlined. For a more comprehensive review on risk factors in the field of gambling, alcohol and drug use and a model for youth gambling prevention programs see Dickson, Derevensky, and Gupta (in press-a). To date there are no studies elucidating protective factors or resilience in youth with respect to the development of problem gambling, however, Dickson, Derevensky, and Gupta (in press-b) hypothesize that protective factors which have been delineated in the reduction of multiple problem behaviors will likely be operative in the moderation and/or buffering of problem gambling as well.

Substance Abuse and Gambling Behavior

Substance use in children and adolescents represents a major public health problem and it has been speculated that there are common underlying risk factors with youth experiencing gambling problems (Dickson et al, in press-a; Jacobs, 1986). The psychological literature has suggested

that while most young people experiment with alcohol and drugs, and some use them regularly for a period of time, the majority fail to develop serious problems or significant negative consequences (Bailey, 1989). Data suggests that most adolescents "mature out" of substance use (Kandel & Logan, 1984). Similar to gambling, substance abuse can best be viewed on a continuum with non-users at one end and excessive users at the other. Between these two extremes is a large proportion of youth who can be categorized as either experimental or casual users (Bailey, 1989).

Similar to the adult literature, adolescent gamblers have been found to be significantly more likely to drink alcohol, smoke tobacco, and use drugs compared to non-gamblers (Griffiths & Sutherland, 1998; Potenza, Steinberg, McLaughlin, Wu, Rounsaville, & O'Malley, 2000; Shaffer & Korn, 2002). In an examination of a series of Minnesota youth studies, consistently high co-morbidity was found between gambling involvement and alcohol and other drug use. Students were 3 times more likely to have never gambled if they had never used drugs compared to drug users. Students were almost 4 times more likely to be a weekly/daily gambler if they were also a weekly/daily user of drugs compared to students who used drugs less frequently or who did not use drugs (Winters & Anderson, 2000). Research has also shown that adolescents who experience problems associated with both gambling and substance use are more likely to engage in delinquent and/or illegal behaviors (Griffiths & Sutherland, 1998).

Common risk-factors for both drug abuse and problem gambling including low self-esteem, depression, suicidality, being a victim of abuse (physical or sexual), poor school performance, history of delinquency, poor impulse control, being male, early onset, parental history of respective problems, and community and family norms that promote accessibility to the respective activity exist. Winters and Anderson (2000) suggest that the association of these two behavior patterns is not trivial given the overlap between the risk-factors. However, the nature of the relationship between drug abuse and gambling remains unclear. Further, while much of the past research has yielded significant variability among study estimates of the comorbidity of substance abuse and gambling as well as the quality of these study methods (Shaffer, Hall, & Vander Bilt, 1997), additional research is needed to shed light on how these common factors lead to the co-existence of gambling and drug use in some youth and not in others, and to what extent unique risk-factors can be identified. The investigation of multiple addictions in problem gambling youth represents an important piece of the puzzle related to the psychosocial variables involved in risky behaviors.

ADHD, Impulsivity and Gambling Behavior

Both the DSM-III-R and DSM-IV (APA, 1987; 1994) include pathological gambling within the category of Impulse Control Disorders, Not Elsewhere Classified. Impulsivity has been conceptualized as an important component of pathological gambling. Research has indicated that pathological gamblers, or a subgroup of pathological gamblers, display elevated levels of impulsivity (Moran, 1970: Zimmerman et al., 1985), with higher levels of impulsivity associated to greater disturbance (Moran, 1970). Increased impulsivity has also been found to be associated with the degree of psychological and behavioral change in pathological gamblers (Blaszczynski, Steel, & McConaghy, 1997) and psychopathy (Dickman, 1990; Eysenck & Eysenck, 1977; Oas,

1985) with at least one marker of psychopathy found to be elevated in pathological gamblers (McCormick, Taber, Kruedelbach, & Russo, 1987). Pathological gamblers have also been found to meet the criteria for personality disorders (borderline, histrionic, and narcissistic) which were also found to be associated with high levels of impulsivity and affective instability (Blaszczynski & Steel, 1998).

Research has indicated that subtle EEG deficits found in recovered pathological gamblers parallel those found in children with attention deficit disorder (ADD). This similarity seems to suggest that gamblers may have shown higher levels of ADD-related behavior during childhood (Carlton, Manowitz, McBride, Nora, Swartzburg, & Goldstein, 1987). Carlton et al. (1987) reported a strong correlation between pathological gambling and childhood behaviors related to ADD on retrospective self-report measures; similar findings have been reported by Rugle and Melamed (1993). Unfortunately, much of the research conducted on ADD and gambling has been based on retrospective adult data, small sample sizes, and treatment samples which included the most severely disordered gamblers.

Childhood onset of ADHD that persists into adulthood has been shown to be associated with increased risk of substance abuse. Both prospective and retrospective studies have recognized an increased risk for PSUD in ADHD patients (Biederman, Wilens, Mick, Milberger, Spencer, & Faraone, 1995; Hartsough & Lambert, 1987; Hechtman & Weiss, 1986; Manshadi, Lippmann, O'Daniel, & Blackman, 1983; Manuzza, Klein, Bessler, Malloy, & LaPadula, 1993; Manuzza, Klein, Bonagura, Malloy, Giampino, & Addalli, 1991; Wilens, 1998). This risk is especially high if substance use or ADHD exists in family members (Wilens, 1998). Alcohol and other drug (AOD) use may also develop earlier in life (mid adolescence) when ADHD is accompanied by certain behavioral or mood disorders. However, the nature of the relationship between ADHD and AOD use among adolescents is unclear. Nonetheless, it is believed that this connection may be mediated by co-occurring disorders (Wilens, 1998). It is believed that ADHD related AOD use may develop as an attempt to alleviate symptoms of mental distress associated with chronic failure, feelings of inadequacy, and conflict with parents and peers (Wilens, 1998).

Generally, the risk for alcohol and drug use or abuse is ascribed to psychiatric comorbidity. However, recent work suggests that ADHD increases the risk of drug/alcohol abuse independent of psychiatric comorbidity (Biederman et al., 1995; Wilens, 1998). Given these findings, the examination of the relationship of ADHD and impulsivity to adolescent gambling behavior and gambling related problems is warranted. Prospective research is needed in order to determine if ADD/ADHD is a risk factor for gambling problems. Finally, given the link between ADHD and CD, the relationship between CD and gambling behavior needs to be examined.

Perceived Social Support: Relationship to Risk Behavior

Adolescent's social relationships are believed to have a strong impact on their emotional health and well being (Rutter, 1995). As such, the study of adolescents' perceptions of these relationships and the way in which they cope with stress and social experiences is important. A number of psychological problems in adulthood, including gambling, are reported to have begun during adolescence (Hendry & Reid, 2000). Further, developmental research has revealed that

when an adolescent's needs are incongruent with their experiences at home, school, or other social contexts, their psychological and behavioral development may be delayed (Hendry & Reid, 2000; Rutter, 1995). This is particularly true if adolescents lack the psychological resources to cope with these challenges (Kloep & Hendry, 1999). Adolescents who are more socially and psychologically vulnerable are likely to experience this developmental period as difficult (Rutter, 1995).

Emotional and behavioral problems during adolescence have been found to be interrelated with troubled relationships in the home, school, or peer group, but the extent to which this co-occurs is unclear. It is widely acknowledged that three key environments (family, peer group, and school) interact with emotional and behavioral problems in adolescence (Garnefski & Doets, 2000). In a recent study on perceived social support and dysfunctioning in a sample of *clinical* (psychiatric inpatients) and *normal* (community based) adolescents age 12-21, results revealed that self-reported emotional and behavioral problems and negative perceptions of family, peer group, and school, were observed in significantly more clinical than normal adolescents (Garnefski & Doets, 2000). Further, the clinical adolescents reported the co-occurrence of emotional, behavioral, and social environmental problems in the contexts of family, school, and peers significantly more than their non-clinical counterparts. More specifically, the co-occurrence of emotional/behavioral problems and family problems was exceedingly strong for the psychiatric inpatient sample. There is an inextricable association between negative family relationships and emotional/behavioral problems in the development of serious adolescent disturbances (Garnefski & Doets, 2000). While Garnefski and Doets (2000) acknowledge that the actual psychopathology of participants impacted their findings, this study presents interesting information on the general association of perceived family relationships and support and the development of emotional and behavioral problems in adolescence.

Perceived social support has been studied in relation to substance use as well. Social support has been listed as a possible protective factor against the development of substance use problems, particularly for individuals with a family history of substance use (Kandel & Andrews, 1987; Wills & Cleary, 1996). This is predominantly true for family support; close, supportive family relationships have been linked with lower drug and alcohol use (Brook, Brook, Gordon, Whiteman, & Cohen, 1990). However, adolescents have been found to place more importance on peer relationships than family relationships, leading many to conclude that perceived support from friends may be more influential on adolescent behavior than perceived support from family (Brown, 1990; Ohanessian & Hesselbrock, 1993). Yet the psychological literature is inconsistent as to the nature of this influence. In some cases, a strong supportive peer network may partially buffer a vulnerable child from negative outcomes (Dodge, Cois, Pettit, & Price, 1990), while in other cases close friendship support has been found to promote an adolescent's risk for substance use (McCubbin, Needle, & Wilson, 1985).

In a similar vein, a link between social environment and adolescent disturbance has been documented. For example, research has indicated that belonging to a *community* is one of the strongest protective factors against both internalizing behaviors (e.g., poor body image, high emotional stress) and externalizing/acting-out behaviors (e.g., drug use, school absenteeism, risk or injury or pregnancy) (Resnick, Harris, & Blum, 1993).

Adolescence is believed to be an important developmental period for the onset of mental health problems and for the need to successfully adapt to many psychosocial changes (Hendry & Reid, 2000). It is also a time of increased sensitivity and vulnerability, frequently associated with emotional and behavioral difficulties (Kazdin, 1990). The perception and utilization of social support systems have been reported to have a buffering effect on reactions to stress, resulting in better adjustment and less emotional and behavioral problems (Cauce, Mason, Gonzales, Hiraga, & Liu, 1994; Dubois, Felner, Sherman, & Bull, 1994; Newcomb & Bentler, 1988). Given the findings on the role of social support in the development of substance use, it is surprising that it is a construct which has never been examined in relation to gambling behavior. It is believed that in order to effectively study the onset of youth gambling behaviors related problems, aspects of social support, social environments, familial climate and interpersonal relationships should be incorporated into research designs.

Academic and Behavioral Problems: Relationship to Gambling Behavior

As mentioned previously, adolescent probable pathological gamblers often have a history of delinquency (Ladouceur et al., 1994a; Maden et al., 1992; Omnifacts Research Ltd., 1993; Stinchfield, 2000; Winters et al., 1993) and are more likely to engage in current delinquent and criminal behaviors (Lesieur & Klein, 1987; Wynne et al., 1996). These individuals are also more likely to have difficulty in school including increased truancy to gamble, decreased academic performance and poor grades (Gupta & Derevensky, 1998a; Ladouceur & Mireault, 1988; Lesieur et al., 1991; Wallisch, 1993). Ladouceur, Boudrealt, Jacques, and Vitaro (1999), examining the relationship between problem gambling and related problems among adolescents, found problem gamblers had been suspended and failed a course or academic year significantly more often than non problem gamblers and potential problem gamblers.

Summary and Conclusions

Despite the extensive research which has enabled the identification of several psychosocial variables that contribute to the development and maintenance of gambling behavior, our knowledge remains incomplete. There has been a call for basic and applied research to investigate psychosocial risk-factors, familial risk and protective factors, and the comorbidity of gambling with other addictions (see Derevensky, Gupta, Dickson, & Deguire, 2001; Dickson et al., in press-b). There is a paucity of empirical research supporting the relationship between several familial, emotional, social, and behavioral variables associated with risk-taking and youth gambling problems. Furthermore, past research has been based primarily upon parent and teacher reports as well as retrospective reports from adult pathological gamblers.

RESEARCH GOALS

The present research project empirically examines the relationship between several risk and protective variables and severity of adolescent gambling. More specifically, the goal is to expand our understanding of the relationship between *self-perceived* familial, social, emotional, and behavioral factors, the development of risk-taking behaviors, and youth gambling problems. As well, this research examines the influence of hyperactivity and impulsivity (constructs which have often been associated with youth gambling problems but not empirically validated) and youth gambling problems. In addition, the occurrence and comorbidity of substance use and abuse in youth with gambling problems are addressed. Finally, developmental and gender differences are considered.

It is anticipated that these results will provide a greater understanding of the factors placing youth at heightened risk for involvement in risk-taking behaviors (gambling and substance abuse) and will provide valuable information that can be used for the identification of high-risk youth and the subsequent development and implementation of prevention and treatment programs.

METHODOLOGY

The current study consists of a descriptive survey of in-school adolescents in the Province of Ontario. The study is cross-sectional in nature and sought to explore correlations between selected risk factors and problem gambling. The study also sought to develop a predictive model of problem gambling from the selected risk factors.

Participants

The total sample included 2,336 adolescents (981 males; 1326 females) in grades 7 through 13 (age range 12-19; $M = 14.76$, $SD = 1.91$) (Table 1). Participants were selected from eight School Boards in the Province of Ontario, representing diverse geographic (both urban and rural) locations.

Table 1: Sample Distribution

	Sample distribution		
Grade	***N***	**%**	**Mean Age**
7	359	15.4	12.09
8	398	17.0	13.05
9	336	14.4	14.01
10	372	15.9	15.03
11	413	17.7	16.04
12	238	10.2	17.16
13	220	9.4	17.95
Total	2336		
Gender			
Male	981	42.5	14.69
Female	1326	57.5	14.82
Total[a]	2307		

[a]Gender was not reported for 29 participants.

The following school boards granted permission to conduct this research: Dufferin Peel Catholic District School Board, Durham Catholic District School Board, Grand Erie District School Board, London Catholic District School Board, Niagara Catholic District School Board, Thames Valley District School Board, Toronto District School Board, and Upper Canada District School Board (Table 2).

Table 2: School Board Distribution

School Board	Sample Distribution	
	N	**%**
Thames Valley	626	26.8
London Catholic	44	1.9
Grand Erie	311	13.3
Upper Canada	119	5.1
Dufferin Peel	520	22.3
Durham Catholic	234	10.0
Toronto District	376	16.1
Niagara Catholic	106	4.5

The present sample was randomly selected and is believed to be representative of the general population. With respect to gambling involvement, the distribution of participants is consistent with reported prevalence studies.

Instruments

Although there is little doubt that parent and teacher rating scales provide a substantial contribution to much of research in child psychology and psychiatry, the importance of self-report measures has been stressed (see reviews by Achenbach, 1995; Orvaschel, Sholomskas, & Weissman, 1980) as they provide invaluable information. Given that teachers have few opportunities to observe the adolescent during the course of the day and that many adolescents engage in behaviors outside parents' or teachers' sight (particularly activities that would conventionally be disapproved by parents and teachers), it is exceedingly difficult for parents and teachers to report on such information. Moreover, internalizing states of depression and anxiety are less likely to be apparent to parents and guardians, especially as children become more independent (Conners, 1997). Overt restlessness tends to decrease with age (Hart, Lahey, Loeber, Applegate, & Frick, 1995) and impulsivity takes on a more cognitive form in adolescents than in younger children. These factors suggest the necessity of greater reliance on self-report data in adolescence. As such, sole reliance on teacher and/or parent ratings may result in respondent bias, and may present an incomplete picture of the child or adolescent. An advantage of self-report measures is that they may eliminate bias or context limitations that can influence the validity of teacher and parent ratings. The use of self-report measures may also result in improved clinical assessment when the nature of the problem involves affective feelings or emotions – experiences that may not be readily apparent to parents or teachers. In comparing parent and adolescent reports, it has been noted that children with internalizing psychopathology are better than their parents at identifying symptoms (Conners, 1997).

Gambling Activities Questionnaire (GAQ) [Gupta & Derevensky, 1996]. The GAQ consists of 13 items and assesses four general domains related to gambling behavior: *Descriptive information* including prevalence and types of activities; *familial gambling and substance abuse history; social networks*; and *academic information.* Questions within each section domain are discrete, analyzed individually, and no cumulative scores are calculated.

DSM-IV-MR-J [Fisher, 2000]. This instrument is a revised version of the DSM-IV-J (Fisher, 1992) and includes 12-items (9-categories) used to screen for pathological gambling during adolescence. The items are modeled after the DSM-IV (APA, 1994) criteria for diagnosis of adult pathological gambling. The revised DSM-IV-J, the DSM-IV-MR-J (MR=multiple response, J=juvenile), was developed for use with adolescents that have gambled during the past year. To compensate for the lack of opportunity for probing, most of the questions in the revised instrument have been given four response options; "never," "once or twice," "sometimes," or "often." The DSM-IV-MR-J represents a more conservative classification system of problem and pathological gambling groups in that various questions now require an endorsement above a certain severity level to receive a score of 1. Any score of 4 of the 9 categories or greater is indicative of pathological gambling. The instrument assesses a number of important variables related to pathological gambling: progression and preoccupation, tolerance, withdrawal and loss of control, escape, chasing, lies, and deception, illegal activities and family/school disruption. The DSM-IV-J has been widely used by several researchers, and has been found to be the most conservative adolescent measure available of pathological gambling (Derevensky & Gupta, 2000a; Gupta & Derevensky, 1998a, 1998b; Volberg, 1998). Internal consistency reliability for this scale is adequate, with Cronbach's alpha = .75 (although slightly lower than .78 for the original DSM-IV-J screen) (Fisher, 2000).

Conners-Wells' Adolescent Self-Report Scale: Long Version (CASS:L) [Conners & Wells, 1997]. The CASS:L is an 87 item-self-report scale, designed for children ages 12-17 (both male and female profiles are provided). This scale is comprised of 10 subscales (Family Problems [12 items], Emotional Problems [12 items], Conduct Problems [12 items], Cognitive Problems [12 items], Anger Control Problems [8 items], Hyperactivity [8 items], ADHD Index [12 items], and DSM-IV Symptoms Subscales [18 items]: DSM-IV Inattentive [9 items] and DSM-IV Hyperactive-Impulsive [9 items]) (scale descriptions can be found in Table 3). For each question, respondents are asked to indicate whether the item is "Not at all True" (never, seldom), "Just a Little True" (occasionally), "Pretty Much True" (often, quite a bit), or "Very Much True" (very often, very frequently). This scale contains rationally derived subscales that relate directly to DSM-IV criteria (APA, 1994). Reliability, internal consistency co-efficients range between 0.75-0.90 and 6 to 8 week test-retest reliability ranges from 0.60-0.90 for the different subscales. Factor analysis on derivation and cross-validation samples was conducted. Convergent, divergent, and discriminant validity was strongly supported (Conners, 1997).

Perceived Social Support from Friends (PSS-Fr) and Family (PSS-Fa) [Procidano & Heller, 1983]. The PSS consists of two, 20 item scales, representing perceived social support available from friends and family members. Participants respond *yes*, *no*, or *don't know* to each of the items on the scales. Both scales are considered global measures of perceived social support with items reflecting emotional, informational, feedback, and reciprocal supports. The PSS scales have been found to have high internal consistency ($\alpha = 0.90$) and test-retest reliability ($\alpha = 0.83$) over a one month period.

Table 3: ***CASS:L Subscale Descriptions***

CASS:L Subscales	High score description
A. Family Problems	Likely to perceive their parents and other family members as uncaring, harsh, or overly critical, they may also feel emotionally detached or distant from family members.
B. Emotional Problems	Reflects low self-esteem and low self-confidence, to feel lonely and isolated, and generally have more worries and concerns than most adolescents their age.
C. Conduct Problems	Likely to break rules; have more problems with persons in authority, and are more likely to have engaged in antisocial activities than most individuals their age. Many items on this scale pertain to serious misbehavior (e.g., destruction of property, taking drugs).
D. Cognitive Problems/Inattention	May be inattentive. They may have more academic difficulties than most individuals their age, have problems organizing and completing tasks, and have particular trouble concentrating on work that requires mental effort.
E. Anger Control Problems	More emotionally labile than individuals their age, and are easily angered and irritated by people around them.
F. Hyperactivity	Have difficulty sitting still; they feel more restless and on the go than most individuals their age.
G. ADHD Index	Identifies adolescents “at-risk” for ADHD.
H. DSM-IV: Inattentive	Indicative of an above average correspondence with the DSM-IV diagnostic criteria for Inattentive type ADHD.
I. DSM-IV: Hyperactive-Impulsive	Indicative of an above average correspondence with the DSM-IV diagnostic criteria for Hyperactive-Impulsive type ADHD.
J. DSM-IV: Total	Indicative of an above average correspondence with the DSM-IV criteria for combined Inattentive and Hyperactive-Impulsive type ADHD.

Personal Experience Screening Questionnaire (PESQ) [Winters, 1992]. The PESQ is an adolescent alcohol and other drug abuse (AOD) screening instrument, for youth aged 12-18. The scale is comprised of 40 items, divided into Problem Severity, Psychosocial Items, and Drug Use History. The Problem Severity section measures the extent to which the respondent is psychologically and behaviorally involved with chemicals. The Psychosocial Items assess personal and environmental problems often associated with adolescent substance use. The Drug Use History shows age of onset and how often, over the preceding 12 months, alcohol, marijuana, and hard drugs (psychedelics, cocaine, amphetamines, quaaludes, barbiturates, tranquilizers, heroin, other narcotics, or inhalants) have been used. In addition, two validity scales measure response distortion, specifically tendencies to "fake good" or "fake bad." The PESQ is reported to have high internal consistency reliability ($\alpha = 0.91$) and construct validity ($\alpha = 0.91$).

It should be noted that while some of the aforementioned instruments are specifically intended for survey purposes (e.g., GAQ, DSM-IV-MR-J), others are clinical screening instruments (e.g., CASS:L, PESQ). However, these instruments have been widely used in research for the purpose of identifying prevalence rates and as screening tools. As such, these instruments were included in the present study.

A copy of all instruments can be found in Appendix A.

Procedure

Thirty school boards in the Province of Ontario were randomly selected to participate and formal applications to conduct research were made to each of these boards from which eight school boards granted permission to conduct the study within their schools, with the understanding that school principals were able to accept or reject the research project. School boards accepting the research project provided the researcher with a complete list of schools, administration staff, and mailing addresses. A random sample of schools within each of the approved boards was approached for their consent.

This procedure was consistent for all the board schools with two exceptions. First, the Toronto District School Board's approval specified access to four schools (two elementary and two high schools) due to research restrictions. These schools which were pre-selected represent different ends of the Learning Opportunities Index (2001-2002) (LOI), an index based on socio-economic status (two schools from the top and two schools from the bottom ranges). These schools were contacted in the same manner as the other schools and agreed to participate in the study. Second, after completing the mailings to schools in the Niagara Catholic District School Board it was discovered that the board inadvertently approved two studies on youth gambling simultaneously. Given that the other approved study was underway, and that schools could not be expected to participate in two studies on the same general topic, one high school and two elementary schools were assigned and agreed to participate in the study.

Data collection was organized around school location, schedule, convenience, and size and took place either in a classroom, cafeteria, or library. In those schools where a large number of

students agreed to participate, or where students were scattered in various classrooms, a large group administration was scheduled in the school's cafeteria or library. During this time, additional research assistants assisted in managing the large groups and ensured adequate supervision. Data collection was also carried out in individual classrooms during the homeroom period or throughout the day (according to administrator specifications so as to create the least disruption possible).

Student participation was voluntary and individuals were able to terminate their participation at any time without consequences. Informed consent was obtained from parents and children prior to their participation. A separate consent form was developed for students age 18 and over as they were able to provide their own consent. Consent forms were sent to participating schools and were distributed to the students via school administration. The consent form informed the parents and students of the nature and procedure of the research. Participating students completed the instruments in one, fifty-minute period.

No deceptive practices were included and participants were assured total anonymity, confidentiality, and were randomly assigned an identification number. Moreover, teachers were requested to either leave the room or remain at the front of the classroom in order to respect participants' confidentiality.

All students were given the same general instructions prior to commencing the study. A trained researcher was present at all times to answer any questions and provide clarification if necessary. Questions were generally limited to word definitions and differed based upon participants' cognitive and developmental level.

Data coding and entry. The data was coded and entered using a Fugitsu (Scan partner 620C) scanner and Optical Mark Recognition software (Remark Office OMR 5.5). This software recognizes optical marks and barcodes. Once the data was collected, completed questionnaires were scanned into the image scanner and subsequently saved as an SPSS 11.0 file set for analysis. This procedure has proven to have a very low data entry error rate.

Data Analyses

Participants were divided into groups based upon gambling severity as measured by their gambling behavior (GAQ) and the DSM-IV-MR-J gambling screen. These groups include non-gamblers, social gamblers (DSM-IV-MR-J score = 0-1), at-risk gamblers (DSM-IV-MR-J score = 2-3), and probable pathological gamblers (DSM-IV-MR-J score $\geq$ 4). The data in this cross-sectional design was analyzed with SPSS 11.0, using a series of statistical procedures including frequency data, univariate analyses and post-hoc tests of significance, a hierarchical cluster analysis, and a logistic regression to examine the relationship between the significant variables and level of gambling severity. Results are also presented for developmental and gender differences.

The original research design involved conducting a MANOVA, with gambling groups, gender and grade as grouping variables, and the constructs PESQ (Problem Severity Scale), CASS-L

(Family Problems, Emotional Problems, Conduct Problems, Cognitive Problems/Inattention, Anger Control Problems, Hyperactivity, ADHD Index, DSM-IV: Inattentive, DSM-IV: Hyperactive-Impulsive, DSM-IV: Total), and PSS (Family and Friends), in order to determine if there were significant differences within the grouping variables on the dependent measures. However, three assumptions must be met before conducting a MANOVA: (1) *normal distribution*: dependent variables should be normally distributed within groups, (2) *homogeneity of variances*: dependent variables must exhibit equal levels of variance across the range of predictor variables, and (3) *homogeneity of variances* and *covariances*: intercorrelations (covariances) between multiple dependent measures must be homogeneous across the cells of the design (Tabachnick & Fidell, 2001). Within this data set, not all dependent variables were normally distributed and variances were deemed to be unequal. Further, one of the cautions in using a MANOVA is that the dependent variables should be largely uncorrelated. If the dependent variables are highly correlated, there is little advantage in including more than one variable in the test given the resultant loss in degrees of freedom and potentially skewed results (Tabachnick & Fidell, 2001). Thus, a hierarchical cluster analysis was conducted in order to determine the associations among the dependent variables. Results revealed that there were strong correlations and associations between the dependent variables. As such, a series of one way ANOVAs were conducted instead of the MANOVA. Finally, Logistic Regression analyses were conducted in order to determine the contribution of risk-factors to the development of problem gambling and other high risk behaviors.

Missing Data

Preliminary analyses of the data revealed that a small number of participants inadvertently skipped one or more items on some of the subscales of the CASS:L, on the PESQ, and the PSS(Fr & Fa) (30 - 80 participants depending upon the scale). As a result, subscale scores were not initially computed for participants on those scales. While this does not appear to be a large number given the overall sample size, as the entire case is excluded when there is any missing data, this loss was determined to be unduly restrictive. As such, an appropriate method to replace missing data was based upon recommendations from the authors of the CASS:L (K. Conners, personal communication, April 10, 2002) and the PESQ (K. Winters, personal communication, April 8, 2002), as well as the head of research at Multi Health Systems (MHS) (G. Sitarenios, personal communication, April 11, 2002). It was highly recommended (Conners, 1997) that an extrapolation formula be used to calculate a value to replace the missing item:

> Extrapolated Raw Score = (Score for Non-Missing Items) * [(Total Number of Items on the Scale)/(Total Number of Non-Missing Items for the Scale)]

This formula was only applied if there were 2 or fewer (less than 10%) missing items. This method was used for the CASS:L and PESQ scales, and resulted in very few missing cases. The PSS is a different type of scale in that items are coded as either a 1 (perceived social support) or 0 (no perceived support or a response of ‘don’t know’). The items on each scale are summed in order to calculate the participants’ score. As such, it was determined that the appropriate procedure for this scale was to replace the missing response with a 0, thus treating it as ‘don’t know.’ This was thought to be the most conservative technique for this scale. Once again, this

process was only applied if there were 2 or fewer (less than 10%) missing items. Overall, data replacement resulted in the total N being a minimum of 2285 for all analyses.

The extrapolation method is generally used to deal with missing data for research purposes (G. Sitarenios, personal communication, April 11, 2002). Although several statisticians recommend not calculating scores for measures when there is missing data, this rule is primarily applied to scales used for a clinical population. Given that the current study consists of a community sample, the use of this procedure for missing data (using the extrapolation technique) rather than exclude the cases (K. Conners, personal communication, April 10, 2002; K. Winters, personal communication, April 8, 2002) was deemed viable.

Response Distortion

Completed questionnaires that were obviously problematic (e.g., ridiculous names, responses completed in an obvious pattern, inconsistent responses, missing more than two scales) were discarded (approximately 2.5%, 60-70 questionnaires).

RESULTS

Gambling Prevalence and Participation

Gambling Groups

The DSM-IV-MR-J (Fisher, 2000) assesses a number of important variables related to pathological gambling: progression and preoccupation, tolerance, withdrawal and loss of control, escape, chasing, lies, and deception, illegal activities and family/school disruption. There are nine categories on the instrument and a score of 4 of the 9 categories or greater is indicative of probable pathological gambling. This screen along with the GAQ was used to classify participants into four groups: Non Gambler (no gambling during the past year), Social Gambler (score 0-1), At-Risk Gambler (score 2-3), and Probable Pathological Gambler (score of 4 or greater). As depicted in Table 4, 33.3% of youth were classified as Non Gamblers, 53.8% as Social Gamblers, 8.0% as At-Risk Gamblers, and 4.9% as Probable Pathological Gamblers. With respect to gender differences in gambling severity, results reveal that males have significantly more gambling problems than females, $\chi^2(3, N = 2299) = 157.43$, $p<.001$. More specifically, males appear to be 5 times more likely to be classified as probable pathological gamblers and 3 times more likely to be classified as at-risk gamblers than females (Table 4).

Table 4: Gambling Severity by Gender and Developmental Level

Sample	*N*	Gambling Groups[1]			
		Non gambler (n=775)	Social gambler[a] (n=1254)	At-risk gambler[b] (n=186)	Probable pathological gambler[c] (n=113)
Gender[***]					
Male	978	22.8	56.3	11.8	9.1
Female	1321	41.2	52.3	4.8	1.7
Grade					
7	356	48.9	43.8	4.5	2.8
8	398	34.7	51.5	8.8	5.0
9	335	34.0	53.4	7.8	4.8
10	371	29.4	58.2	7.8	4.6
11	412	32.5	52.7	9.2	5.6
12	237	24.1	62.9	8.4	4.6
13	219	22.4	60.3	10.0	7.3
Total[d]	2328	33.3	53.8	8.0	4.9

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (≥4).
[d]8 participants did not complete DSM-IV-MR-J.
[***] $p<.001$.

As can be seen in Table 4, probable pathological gambling is lowest in grade 7, remains relatively steady in grade 8 through 12, and jumps significantly in grade 13, $\chi^2(18, N = 2328) = 69.84$, $p<.001$. The same pattern can be observed for the at-risk gambling group. It should be noted that grade 13 students are approximately 18 years of age ($M = 17.95$, $SD = 0.53$) and are legally permitted to gamble on the lottery (scratch tickets, sports betting, and draws) but not casino wagering in Ontario (legal age is 19).

Participation in Gambling Activities

Participants were asked about their general gambling behavior and frequency of such behavior within the past 12 months. Overall, results revealed that a large percentage of adolescents reported engaging in a variety gambling activities within the past year. The distribution of gambling involvement can be seen in Table 5. Overall, 66% of adolescents reported gambling within the past year (77.2% males, 58.8% females), with 20% of youth engaging in such activities on a regular basis (28.0% males; 11.4% females). Chi Square analyses revealed significant gender differences with respect to gambling involvement, such that males are more likely to be regular gamblers than females, $\chi^2(2, N = 2299) = 140.90$, $p<.001$.

Table 5: Gender Differences in Gambling Involvement

Gender	*N*	Gambling Involvement[1]		
		Non Gambler[a]	Occasional Gambler[b]	Regular Gambler[c]
Male	978	22.8	49.2	28.0
Female	1321	41.2	47.4	11.4
Total	2299	33.4	48.2	18.5

[1]Percentage.
[a]Reporting 'never' wagering on any activity within the past year; [b]reporting having wagered 'less than once a week' on any activity within the past year; [c]reporting having wagered 'once a week or more' on any activity within the past year.

The most popular activities were cards, sports pools, lottery, bingo, and wagering on games of skill (see Table 6). With respect to occasional involvement in gambling activities (less than once a week), adolescents reported playing cards (29.6%), lottery (lottery draws and scratch cards) (27.0%), sports pools (20.0%), bingo (19.7%), and games of skill (16.8%). However, if all forms of lottery activities are combined (sports lottery, lottery draws, and scratch cards), the lottery becomes the most popular form of 'occasional' gambling (29.7%). The most popular activities that participants engaged in on a regular basis (once a week or more) included cards (6.6%), sports pools (4.6%), games of skill (4.3%), and lottery (lottery draws and scratch cards) (4.2%). Once again, combining all forms of lottery (sports lottery, lottery draws, and scratch cards), the lottery becomes the most popular form of regular gambling (7.6%).

Males reported engaging in all activities significantly more than females, with the exception of occasional lottery play (females 29.1%; males 24.4%), occasional bingo (females 20.0%, males 19.4%), regular bingo (females 2.2%; males 2.3%), and regular internet gambling with money (females 0.5%; males 0.6%).

The top three preferred 'occasional' activities for males were cards (37.8%), sports pools (31.9%), and wagering on games of skill (26.5%). For females the top three 'occasional' activities were the lottery (29.1%), cards (23.1%), and bingo (20.0%). With respect to preferred 'regular' activities, the top activity reported by both males and females was cards (males 10.1%; females 3.9%), the second most popular preferred activity was sports pools for males (8.8%) and the lottery for females (2.8%), while the third most popular activity was games of skill for males (8.4%) and bingo for females (2.2%). Once again, if sports lottery and lottery draws are combined, the lottery becomes the most popular for males and females (Table 7). No particular developmental trends were noted. (For detailed developmental differences in gambling activities see Table B1, Appendix B).

Table 6: Involvement in Gambling Activities

Activities	Gambling Involvement[1]		
	Never	Occasionally[a]	Regularly[b]
Cards	63.8	29.6	6.6
Sports pool	75.0	20.0	4.6
Sports lottery	86.9	9.7	3.4
Lottery	68.8	27.0	4.2
Videogames	89.7	8.1	2.2
VLT machines	93.7	5.6	0.7
Bingo	78.0	19.7	2.3
Slot machines	93.9	5.0	1.0
Games of skill	78.9	16.8	4.3
Racetrack	95.0	4.3	0.7
Casino games	92.7	6.3	1.0
Internet gambling ($)	97.2	2.2	0.6

[1]Percentage.
[a]Refers to gambling less than once a week. [b]Refers to gambling once a week or more.

With respect to regular involvement in gambling activities by gambling severity, probable pathological gamblers reported engaging in all activities significantly more than social gamblers and at-risk gamblers. The preferred activity for probable pathological gamblers is cards (37.2%), sports pools (36.6%), games of skill (35.4%), and sports lottery (27.7%), while the preferred activity for at-risk gamblers is cards (19.0%), sports pools (14.7%), games of skill (14.7%), and sports lottery (13.6%). Interestingly, social gamblers appear to prefer cards (6.1%), the lottery (4.2%), and sports pools (3.1%). Combining lottery draws, scratch cards, and sports lottery reveals that the lottery is the preferred activity of all gamblers (Table 8).

Table 7: Involvement in Gambling Activities: Gender Differences

Activities	Gambling Involvement[1]			
	Occasional[a]		Regular[b]	
	Male	Female	Male	Female
Cards***	37.8	23.1	10.1	3.9
Sports pool***	31.9	10.8	8.8	1.5
Sports lottery***	14.4	6.1	6.8	0.9
Lottery***	24.4	29.1	6.0	2.8
Videogames***	15.5	2.6	4.5	0.5
VLT machines***	7.0	4.4	1.3	0.2
Bingo	19.4	20.0	2.3	2.2
Slot machines*	5.7	4.5	1.5	0.6
Games of skill***	26.5	9.3	8.4	1.1
Racetrack***	5.6	3.0	0.9	0.5
Casino games***	8.9	4.1	1.4	0.7
Internet gambling ($)***	3.6	1.3	0.6	0.5

[1]Percentage.
[a]Refers to gambling less than once a week. [b]Refers to gambling once a week or more
*p<05. ***p<001.

Table 8: Regular[d] Involvement in Gambling Activities: Gambling Severity

Activities	Gambling Groups[1]		
	Social gambler[a]	At-risk gambler[b]	Probable pathological gambler[c]
Cards***	6.1	19.0	37.2
Sports pool***	3.1	14.7	36.6
Sports lottery***	1.9	13.6	27.7
Lottery***	4.2	12.1	20.4
Videogames***	1.6	4.3	21.2
VLT machines***	0.5	2.2	6.2
Bingo***	2.6	4.9	9.7
Slot machines***	0.9	1.6	8.8
Games of skill***	2.6	14.7	35.4
Racetrack***	0.5	2.7	4.4
Casino games***	0.5	3.3	10.6
Internet gambling ($)***	0.2	2.7	4.5

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score ($\geq$ 4).
[d]Refers to gambling once a week or more.
***p<001.

It should be noted that participants were queried about internet gambling *without* money in order to ascertain the proportion of individuals engaging in this activity. It has been speculated that playing online casino games *without* money may be a precursor to internet gambling (with money) as well as other types of gambling behavior. As can be seen in Table 9, internet gambling without *money* is a popular activity for males in general and at-risk and probable pathological gamblers, significantly more so than internet gambling for money.

Perceived Familial and Peer Problem Behavior

Past research has suggested that individuals who have gambling-related problems are more likely to have a parent or a family member with an addiction. As such, participants indicated whether they thought any of the following people (family members, friends, and acquaintances) were experiencing a gambling problem, drug or alcohol problem. Overall, of those individuals who reported that family or peers were believed to have a gambling problem, 3.6% were mothers/stepmothers, 5.3% fathers/stepfathers, 1.2% sisters, 2.8% brothers, 13.5% other relatives, 11.9% friends, 10.0% classmates, and 5.6% other people in their lives. Those individuals who reported that family or peers were believed to have a drug and/or alcohol problem indicated that 3.2% were mothers/stepmothers, 12.5% fathers/stepfathers, 2.8% sisters, 5.4% brothers, 20.4% other relatives, 26.7% friends, 20.0% classmates, 7.2% other people in their lives (see Table 10).

Table 9: Regular[d] Internet Gambling: With and Without Money

Sample	Internet Gambling			
	For money***		For fun***	
Gender	***N***	**%**	***N***	**%**
Male	6	0.6	92	9.4
Female	6	0.5	48	3.7
Gambling Groups				
Social gambler[a]	3	0.2	79	6.3
At-risk gambler[b]	5	2.7	38	20.4
Probable pathological gambler[c]	5	4.5	28	25.0
Total	13	0.6	145	6.3

[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (≥ 4). [d]Refers to gambling once a week or more.
*** $p<001$.

As can be seen in Table 10, more participants reported that someone in their family or friendship circle has a substance abuse problem (drug or alcohol) compared to a gambling problem, with the exception of maternal gambling (3.6%) which is quite similar to maternal substance abuse (3.2%).

With respect to gambling severity, results revealed that probable pathological and at-risk gamblers reported perceiving significantly more family members and peers as having a gambling problem than non gamblers and social gamblers. Linear trends were observed for all individuals

across gambling groups such that non gamblers reported the least and probable pathological gamblers reported the most perceived gambling problems. With respect to family members, probable pathological gamblers reported significantly more fathers/stepfathers (13.3%), $\chi^2(3, N = 2328) = 27.44$, $p<.001$, and other relatives (25.7%), $\chi^2(3, N = 2328) = 33.96$, $p<.001$, with perceived gambling problems compared to at-risk gamblers (9.7% and 18.8% respectively). Both probable pathological and at-risk groups equally reported (yet significantly greater than the other groups) that to their knowledge their mother/stepmother (7.1% and 7.5% respectively), their brother (8.0% and 7.5% respectively), and sister (5.3% and 3.2% respectively) had gambling problems. With respect to peers, a linear trend was observed for the reported gambling problems of friends, with probable pathological gamblers reporting a significantly greater percentage of friends (43.4%), $\chi^2(3, N = 2328) = 173.65$, $p<.001$, who have gambling problems. This same trend is observed for classmates (32.7%), $\chi^2(3, N = 2328) = 87.22$, $p<.001$, and other individuals in the participants' lives (12.4%) (Table 11).

Table 10: Perceived Familial and Peer Problems

Problem Individual	Perceived Problems[1]	
	Gambling	Substance Abuse
Family Member		
Mother / Stepmother	3.6	3.2
Father / Stepfather	5.3	12.5
Sister	1.2	2.8
Brother	2.6	5.4
Other Relative	13.5	20.4
Friend	11.9	26.7
Classmate	10.0	20.0
Significant Other	5.6	7.2

[1]Percentage.

With respect to individuals whom adolescents thought were experiencing a drug and/or alcohol problem, probable pathological and at-risk gamblers reported significantly more family members and peers who are perceived to suffer from a drug and/or alcohol problem. More specifically, probable pathological gamblers reported significantly more father/stepfathers (22.1%), $\chi^2(3, N = 2328) = 15.43$, $p<.001$, brothers (19.5%), $\chi^2(3, N = 2328) = 53.93$, $p<.001$, and other relatives (35.4%), $\chi^2(3, N = 2328) = 42.41$, $p<.001$, with reported substance use problems than at-risk gamblers (15.6%, 8.1%, and 25.3% respectively).

While rates were still significantly higher than non gamblers and social gamblers, no differences were found between adolescent probable pathological gamblers and at-risk youths' reported knowledge regarding the gambling problems of their mother/stepmothers (5.3% and 5.9% respectively) and sisters (8.8% and 5.9% respectively). With respect to peers, probable pathological gamblers reported significantly more friends (59.3%), $\chi^2(3, N = 2328) = 103.65$, $p<.001$, and classmates (36.3), $\chi^2(3, N = 2328) = 30.03$, $p<.001$, with perceived substance use problems compared to other youth. Finally, no group differences were found with respect to the

perception of a drug and/or alcohol problem of other significant people in the participants' lives (see Table 12).

Table 11: Perceived Familial and Peer Gambling Problems: Gambling Severity

Problem Individual	Gambling Groups[1]			
	Non gambler	Social gambler[a]	At-risk gambler[b]	Probable pathological gambler[c]
Family Member				
Mother/Stepmother***	1.7	4.0	7.5	7.1
Father/Stepfather***	3.4	5.1	9.7	13.3
Sister***	0.3	1.1	3.2	5.3
Brother***	1.0	2.3	7.5	8.0
Other Relative***	8.9	14.6	18.8	25.7
Friend***	4.9	11.6	25.3	43.4
Classmate***	5.5	10.0	15.1	32.7
Significant Other***	4.0	5.5	9.1	12.4

[1]Percentage
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (≥ 4).
*** p<001.

Table 12: Perceived Familial and Peer Substance Abuse (Drug/Alcohol) Problems: Gambling Severity

Problem Individual	Gambling Groups[1]			
	Non gambler	Social gambler[a]	At-risk gambler[b]	Probable pathological gambler[c]
Family Member				
Mother / Stepmother*	1.9	3.4	5.9	5.3
Father / Stepfather***	10.1	12.7	15.6	22.1
Sister***	1.5	2.5	5.9	8.8
Brother***	3.1	5.3	8.1	19.5
Other Relative***	13.8	22.5	25.3	35.4
Friend***	17.0	28.9	31.2	59.3
Classmate***	15.5	21.4	20.4	36.3
Significant Other	6.8	7.0	9.7	8.0

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (≥ 4).
* p<05. *** p<001.

Social Factors

Past research has suggested that social relationships and community belonging are extremely important in the development of adolescent health and well being. In order to investigate these constructs, participants were asked a series of questions regarding their friendships, satisfaction with their social life, and involvement in community activities. With respect to their social relationships, participants reported whether they had a confidante and if so, with whom they confide (e.g., friend, parent, sibling, other relative, teacher, clergy, and counselor) (multiple responses were permitted).

Overall, 88% of the total sample reported having a close confidante. Of those individuals, 70.2% reported having a friend, 46.1% a parent, 31.5% a sibling, 22.1% a relative, 9.9% a teacher, 5.0% a counselor or psychologist, and 4.8% a clergy member as a confidante. With respect to gender, more females (92.9%) compared to males (81.9%) reported having a confidante. Moreover, a greater percentage of females reported having all types of confidantes with the exception of a member of the clergy (males 6.6%, females 3.6%). More specifically, significantly more females reported having friends as confidantes (80.8% vs. 55.7%), siblings (35.6% vs. 26.0%), and other relatives (24.6% vs. 18.5%) (Table 13).

Table 13: Types of Confidantes: Gender Differences

Confidante	Gender[1]		
	Male	Female	Total[1]
Confidante reported***	81.9	92.9	88.3
Friend***	55.7	80.8	70.2
Sibling***	26.0	35.6	31.5
Parent	44.8	47.3	46.1
Other Relative***	18.5	24.6	22.1
Teacher**	7.8	11.5	9.9
Clergy***	6.6	3.6	4.8
Counselor/Psychologist*	3.8	6.0	5.0
Other**	5.8	8.7	7.4

[1]Percentage.
*p<05. **p<01. ***p<001.

With respect to developmental differences, it is interesting to note that as children get older they report having more close friends (grade 7, 61% - grade 13, 78.2%), whereas those reporting a parent as a confidante decreased with age (grade 7, 57.4% - grade 13, 41.8%) (Table 14).

Table 14: Types of Confidantes: Developmental Differences

Confidante	Grade[1]						
	7	8	9	10	11	12	13
Confidante reported	88.5	89.8	84.6	89.6	87.0	87.3	91.8
Friend***	61.0	65.3	67.3	73.9	76.0	73.1	78.2
Sibling	32.0	31.2	28.3	28.2	33.9	31.1	37.7
Parent***	57.4	49.7	41.1	41.7	46.0	40.8	41.8
Other Relative	23.4	26.9	20.8	22.3	18.6	20.6	20.9
Teacher**	13.4	11.3	6.5	6.2	10.7	8.4	13.2
Clergy	5.6	3.8	6.0	4.6	5.6	5.0	2.7
Counselor/Psychologist	4.2	3.5	6.0	3.8	6.1	4.2	8.2
Other***	4.2	8.5	6.0	5.1	7.5	10.9	12.7

[1]Percentage.
**p<01. ***p<001.

Interestingly, the percentage of reported confidantes significantly decreases as gambling severity increases. For example, 88.5% of non gamblers and 89.8% of social gamblers report having confidantes compared to 82.1% of at-risk gamblers and 80% of probable pathological gamblers, $\chi^2(3, N = 2297) = 17.05$, p<.001. This trend can be observed for the types of confidantes reported as well. Probable pathological gamblers report having significantly fewer friends (80.0%), $\chi^2(3, N = 2328) = 14.96$, p<.01, and parents (58.4%), $\chi^2(3, N = 2328) = 50.60$, p<.001, as confidantes compared to non gamblers and social gamblers (Table 15). Information on the perceived social support provided by youths' friends and family will be examined later in this section.

Participants were also questioned about the number of friends they have and their satisfaction with their social life. A linear trend can be observed with respect to the number of friends reported, with probable pathological gamblers reporting that they have more friends (six or more) (48.7%) compared with non gamblers (37.9%). No group differences were observed with respect to satisfaction with social life (see Table 16).

Adolescent participation in community organizations including community centres, religious organizations, cub scouts/girl guides, sports team or other membership (they were permitted to have more than one response) was ascertained. With respect to the total sample, 6.7% of youth reported that they belong to a community centre, 18.4% to a religious organization, 3.1% to cub scouts/girl guides, 41.8% to a sports team, and 14.7% to various other organizations (e.g., drama/theatre groups, music groups, fitness club, dance groups, youth/leadership groups). Females appear to report significantly more involvement in community organizations, including religious (20.7% vs. 15.4%), $\chi^2(1, N = 2307) = 10.71$, p<.001; guides/scouts (4.1% vs. 1.9%), $\chi^2(1, N = 2307) = 8.39$, p<.01; and 'other' organizations (16.4% vs. 12.6%), $\chi^2(1, N = 2307) = 6.45$, p<.05, compared to males (Table 17). Males, on the other hand, report belonging to a sports team significantly more than females (51.0% vs. 34.7%), $\chi^2(1, N = 2307) = 61.49$, p<.001.

Table 15: Types of Confidantes: Gambling Severity

Confidante	Gambling Groups[1]			
	Non gambler	Social gambler[a]	At-risk gambler[b]	Probable pathological gambler[c]
Confidante reported**	88.5	89.8	82.1	80.0
Friend**	70.1	72.6	63.4	58.4
Sibling	31.9	32.8	26.9	23.9
Parent***	54.2	45.0	30.1	31.0
Other Relative	23.6	22.2	16.7	19.5
Teacher*	11.4	8.5	14.0	8.8
Clergy	5.9	4.4	4.3	2.7
Counselor/Psychologist	4.6	4.8	5.9	8.0
Other	6.3	7.3	8.1	13.3

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (≥ 4).
*p<.05. **p<01. ***p<001.

Table 16: Number of Close Friends and Life Satisfaction: Gambling Severity

Social Relationships	Gambling Groups[1]			
	Non gambler	Social gambler[a]	At-risk gambler[b]	Probable pathological gambler[c]
Number of Close Friends				
1	6.0	4.7	4.9	7.1
2–3	30.0	27.3	26.5	21.2
4–5	23.5	25.5	23.2	22.1
6 +	37.9	40.7	42.2	48.7
Satisfaction Level				
Not Happy	11.1	12.3	16.3	13.3
Satisfied	49.6	51.8	47.3	54.0
Very Pleased	39.2	35.8	36.4	32.7

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (≥ 4).

Developmental trends indicated that involvement in community organizations significantly decreased with age, particularly for involvement in community centres, $\chi^2(6, N = 2336) = 14.22$, $p<.05$, scouts/guides, $\chi^2(6, N = 2336) = 14.18$, $p<.05$, and membership in a sports team, $\chi^2(6, N = 2336) = 52.42$, $p<.001$ (see Table 18).

Table 17: Membership in Community Organizations: Gender Differences

Organization	Gender[1]		
	Male	Female	Total[1]
Community Centre	5.9	7.2	6.7
Religious Organization***	15.4	20.7	18.4
Cub Scouts / Girl Guides**	1.9	4.1	3.1
Sports Team***	51.0	34.7	41.8
Other*	12.6	16.4	14.7

[1]Percentage.
*p<.05. **p<.01. ***p<.001.

Table 18: Membership in Community Organizations: Developmental Differences

Organization	Grade[1]						
	7	8	9	10	11	12	13
Community Centre*	9.7	8.5	3.6	6.5	5.6	7.1	5.5
Religious Organization	17.0	21.1	15.5	16.1	17.2	21.4	22.7
Cub Scouts / Girl Guides*	6.1	3.0	2.7	3.0	2.4	2.5	1.4
Sports Team***	51.0	48.2	47.0	41.1	36.6	30.7	30.0
Other	15.6	15.3	14.3	18.0	12.6	12.2	13.6

[1]Percentage. *p<.05. ***p<001.

Interestingly, with respect to gambling severity, no group differences were found with respect to involvement in a community centre, scouts/guides, or 'other' social groups. However, a greater percentage of non gamblers (21.7%) report belonging to a religious organization compared to at-risk (14.5%) and probable pathological gamblers (15.0%), $\chi^2(3, N = 2328) = 9.59$, p<.05. The reverse trend is true with respect to membership in a sports team, with a significantly greater percentage of probable pathological (46.9%) and at-risk gamblers (48.4%) reporting involvement in group sport activities than non gamblers (36.8%), $\chi^2(3, N = 2328) = 9.59$, p<.05 (Table 19). These differences may, in fact be due to gender differences, as significantly more male probable pathological gamblers (53.9%) compared to female probable pathological gamblers (22.7%) reported participating in sports teams.

Academic Factors

Academic achievement and investment in school have often been cited as protective factors against the development of psychopathology. To assess whether this applies to problem gambling, participants responded to several questions regarding their academic achievement. These questions included: Were you ever diagnosed with a learning disability or learning problem? What type of student would you describe yourself as (fast, average, slow learner)? Do you do well in school? What is your overall grade average? The distribution of responses can be seen in Table 20.

Table 19: Membership in Community Organizations: Gambling Severity

Organization	Gambling Groups[1]			
	Non gambler	Social gambler[a]	At-risk gambler[b]	Probable pathological gambler[c]
Community Centre	6.3	6.6	8.6	8.0
Religious Organization*	21.7	17.1	14.5	15.0
Cub Scouts / Girl Guides	3.5	3.1	1.6	3.5
Sports Team**	36.8	43.5	48.4	46.9
Other	16.0	13.9	15.1	14.2

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (≥ 4)
*p<.05. **p<01.

The majority of participants believe they do well in school (80.5%) and they are average (56.9%) or fast learners (35.4%). Approximately 10% of the sample reported that they were previously diagnosed with a learning disability or learning problem. Significantly more males than females reported that they were diagnosed with a learning disability, $\chi^2(1, N = 2292) = 7.86$, p<.01, and rated themselves as slow learners, $\chi^2(2, N = 2293) = 26.09$, p<.001. Females rated themselves significantly more than males as average learners, $\chi^2(2, N = 2293) = 26.09$, p<.001. No differences were found in the proportion of males and females who rated themselves as fast learners. These trends were evident in the participants' reported overall grade average; an independent samples t-test revealed that females (M = 77.76, SD = 9.24) indicated they had a significantly higher academic average than males (M = 74.41, SD = 10.47), $t(2165) = -7.86$, p< .001. With respect to developmental differences, no interesting trends or disparity were noted.

Table 20: Endorsement of Items Regarding Academic Factors: Gender Differences

Academic Factors	Gender[1]		
	Males	Females	Total[1]
Have you ever been diagnosed with a learning disability[d]? *	11.8	8.3	9.8
What type of student would you describe yourself as?			
Faster learner	38.4	33.2	35.4
Average learner ***	51.5	60.9	56.9
Slow learner ***	10.2	5.9	7.7
Do you do well in school?	73.7	85.4	80.5

[1]Percentage.
[d]or learning problem.
*p<.01. ***p<.001.

Results for gambling severity revealed that a significantly greater percentage of probable pathological gamblers reported having been diagnosed with a learning disability, $\chi^2(3, N = 2314) = 33.17$, $p<.001$, and classified themselves as slow learners, $\chi^2(6, N = 2317) = 31.77$, $p<.001$, compared to non gamblers and social gamblers. Furthermore, a significantly smaller percentage of at-risk (66.7%) and probable pathological gamblers (54.9%) reported they do well in school in contrast to non gamblers (84.7%) and social gamblers (81.9%), $\chi^2(3, N = 2314) = 79.06$, $p<.001$ (see Table 21). Consistent with these findings, probable pathological gamblers reported significantly lower overall grade averages ($M = 69.50$, $SD = 11.88$) than the other groups: non gamblers ($M = 77.22$, $SD = 9.73$), social gamblers ($M = 76.89$, $SD = 9.42$), and at-risk gamblers ($M = 72.97$, $SD = 11.12$), $F(3, 2186) = 27.56$, $p<.001$. Participants' cognitive difficulties were assessed with the Cognitive Problems subscale of the CASS:L. Results were consistent with findings that probable pathological gamblers have academic difficulties and confirm that they are experiencing more cognitive problems than other youth (Tables 23 & 25). These results are presented in greater detail later in this section.

Table 21: Endorsement of Items Regarding Academic Factors: Gambling Severity

Gambling Groups[1]		Learning Disability***	Type of student			Do well in school***
			Fast learner***	Average learner	Slow learner***	
Non gambler						
	Male	11.7	36.5	50.5	13.1	78.3
	Female	8.4	33.4	60.3	6.3	87.5
	Total	9.4	34.3	57.3	8.3	84.7
Social gambler[a]						
	Male	10.0	42.2	49.6	8.2	76.6
	Female	6.2	34.3	61.6	4.1	86.0
	Total	7.8	37.8	56.3	5.9	81.9
At-risk gambler[b]						
	Male	14.0	31.6	53.6	8.8	66.4
	Female	18.8	23.4	57.8	18.8	67.2
	Total	15.8	27.6	60.0	12.4	66.7
Probable pathological gambler[c]						
	Male	18.2	29.2	55.1	15.7	52.8
	Female	36.4	13.6	68.2	18.2	68.2
	Total	22.3	25.7	57.5	16.8	54.9

[1]Percentage of endorsement
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score ($\geq$ 4). [d]or learning problem.
***p<.001 (across gambling groups).

Interestingly, when gender differences were examined within gambling groups (Table 21), it was observed that twice as many female probable pathological gamblers (36.4%) reported having been diagnosed with a learning disability as compared to males (18.2), while fewer PPG females report that they are fast learners (13.6%) compared to males (29.2%). Thus, more female

problem gamblers appear to report academic difficulties than their male counterparts. No notable differences were found between at-risk males and females.

Family Composition

Family composition has not been previously studied in relation to gambling behavior and related problems. It is of interest to examine the family composition of problem gamblers in order to assess their family constellation. It has been speculated that probable pathological gamblers would be more likely to live in single parent homes, where a parent is missing due to death or divorce. In order to ascertain participants' family constellation, adolescents reported all family members living within their home. Responses were combined to yield categories including intact family, single parent family, and not living with either parent. Overall, 72.3% of participants reported living in an intact family, 23.9% in a single parent home, and 3.9% not living with a parent. While not statistically significant, a greater percentage of probable pathological gamblers reported not living with a parent (7.1%) than the other groups: non gamblers (3.4%), social gamblers, (3.3%), and at-risk gamblers (5.9%). No statistically significant gender or developmental differences were noted.

Psychosocial Factors and Youth Gambling

Conners-Wells' Adolescent Self-Report Scale

The CASS:L is comprised of 10 subscales (Family Problems, Emotional Problems, Conduct Problems, Cognitive Problems, Anger Control Problems, Hyperactivity, ADHD Index, and DSM-IV Symptoms Subscales: DSM-IV Inattentive and DSM-IV Hyperactive-Impulsive). A description of high scores on each of the subscales can be seen in Table 3. It should also be noted that the CASS:L has been normed for 12-17 year olds. Given that this scale was developed for clinical use, it was decided to include some older youth in analyses but to interpret these results with caution.

Participants' raw scores on each of the ten subscales were calculated and transformed into T-scores ($M = 50$, $SD = 10$), according to the test manual (T-scores are covaried for age and gender). In order to determine the proportion of youth who scored in the clinical range on each of the 10 subscales, scores were divided into normal (T-Score 40-59), clinical range 1 (1 *SD* above the mean) (T score = 60-69), and clinical range 2 (2 *SD* above the mean) (T score $\geq$ 70). It should be noted that the manual suggests a clinical cutoff of a T-score which is 1½ *SD* above the mean ($\geq$ 65) for therapeutic purposes. However, for the results of the present study it was decided that a clinical cutoff of 1 *SD* above the mean would be satisfactory. Frequencies for the total sample revealed that 19.6% of participants had scores in the clinical range on the Family Problems subscale, 20.6% on the Emotional Problems subscale, 23.2% on the Conduct Problems subscale, 17.9% on the Cognitive Problems-Inattention subscale, and 13.8% on the Anger Control Problems subscale (Table 22). Nineteen percent of the sample met the criteria for ADHD, as assessed by the ADHD Index, with 12.6% meeting criteria for Hyperactivity. Regarding DSM-IV problems, 20.6% scored positively on the DSM-IV Total subscale, while

20% met the clinical criteria for Inattentive symptoms and 18.5% for Hyperactive Impulsive symptoms (see Table 22).

Table 22: Clinical Cutoffs on the CASS:L: Total Sample

CASS:L Subscales	Clinical Cutoffs[1]			
	Normal (≤ 59)	Clinical 1 (60-69)	Clinical 2 (≥ 70)	Clinical Total
A. Family Problems	80.3	13.7	5.9	19.6
B. Emotional Problems	79.4	15.3	5.3	20.6
C. Conduct Problems	76.8	14.0	9.2	23.2
D. Cognitive Problems/Inattention	82.1	13.0	4.9	17.9
E. Anger Control Problems	86.2	11.0	2.8	13.8
F. Hyperactivity	87.5	10.5	2.1	12.6
G. ADHD Index	81.0	14.5	4.5	19.0
H. DSM-IV: Inattentive	80.0	14.6	5.4	20.0
I. DSM-IV: Hyperactive-Impulsive	81.5	14.4	4.1	18.5
J. DSM-IV: Total	79.4	15.2	5.4	20.6

[1]Percentage.

Crosstabulations were conducted to determine if any gambling group differences were present. Overall, across all subscales, probable pathological gamblers were found to exhibit significantly more psychopathology than all other groups (i.e., a significantly greater percentage had scores in the clinical range for all subscales) (see Tables 23 & 24). For ease of interpretation, CASS:L subscales are presented in two Tables depicting social, emotional, and behavioral problems (Table 23) and ADHD and related subtypes (Table 24).

As can be seen in Tables 23 and 24, Conduct Problems appears to be the largest clinical problem for probable pathological gamblers as approximately 70% of PPGs reported experiencing such problems at clinical levels. Further, approximately 50% of PPGs reported experiencing family problems, ADHD symptoms, and DSM-IV: Total symptoms at clinical levels. These endorsements are in stark contrast to at-risk, social, and non gamblers and higher than expected given the normal representations.

More specifically PPGs (49.5%) and at-risk (30.1%) gamblers reported having more family problems in contrast to social (18.0%) and non gamblers (15.1%). Regarding emotional problems, a greater percentage of PPGs (41.6%) and at-risk (31.7%) gamblers had scores in the clinical range compared to social (19.0%) and non gamblers (17.2%). PPGs (42.5%) and at-risk (27.4%) gamblers also reported significantly more cognitive problems than social (16.9%) and non gamblers (13.6%) (Table 23).

Table 23: CASS:L Clinical Cutoffs: Social, Emotional, & Behavioral Problems

CASS:L Subscales	T-Scores[1]			
	Normal (≤ 59)	**Clinical 1 (60-69)**	**Clinical 2 (≥ 70)**	**Clinical Total**
Family Problems***				
Non gambler	84.9	11.1	4.0	15.1
Social gambler[a]	82.0	12.7	5.3	18.0
At-risk gambler[b]	69.9	19.9	10.2	30.1
Probable pathological gambler[c]	50.4	32.7	16.8	49.5
Emotional Problems***				
Non gambler	82.8	13.3	3.9	17.2
Social gambler[a]	80.9	14.4	4.6	19.0
At-risk gambler[b]	68.3	24.2	7.5	31.7
Probable pathological gambler[c]	58.4	23.0	18.6	41.6
Conduct Problems***				
Non gambler	88.0	7.9	4.1	12.0
Social gambler[a]	77.5	14.6	7.9	22.5
At-risk gambler[b]	54.3	23.1	22.6	45.7
Probable pathological gambler[c]	29.2	34.5	36.3	70.8
Cognitive Problems***				
Non gambler	86.3	9.5	4.1	13.6
Social gambler[a]	83.1	12.1	4.8	16.9
At-risk gambler[b]	72.6	21.5	5.9	27.4
Probable pathological gambler[c]	57.5	31.9	10.6	42.5
Anger Control Problems***				
Non gambler	90.6	7.7	1.7	9.4
Social gambler[a]	86.5	11.1	2.4	13.5
At-risk gambler[b]	77.4	17.2	5.4	22.6
Probable pathological gambler[c]	67.3	22.1	10.6	32.7

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (≥ 4).
***Significant differences across gambling groups (p<.001)

Probable pathological gamblers (29.2%) reported more clinical symptoms related to hyperactivity compared to at-risk (18.8%), social (13.3%), and non (13.3%) gamblers. Significantly more PPGs (49.6%) had scores in the clinical range on the ADHD Index subscale than at-risk (31.7%), social (18.2%) and non (12.7%) gamblers. A significantly greater percentage of PPGs (53.9%) reported clinical levels of DSM symptomatology (Inattentive & Hyperactive Impulsive subtypes) in contrast to at-risk (32.8%), social (21.2%), and non (11.9%) gamblers (Table 24).

Table 24: CASS:L Clinical Cutoffs: ADHD and Subtypes

CASS:L Subscales	T Scores[1]			
	Normal (≤ 59)	Clinical 1 (60-69)	Clinical 2 (≥ 70)	Clinical Total
Hyperactivity***				
Non gambler	92.6	6.3	1.0	7.3
Social gambler[a]	86.7	11.4	1.9	13.3
At-risk gambler[b]	81.2	14.0	4.8	18.8
Probable pathological gambler[c]	70.8	23.0	6.2	29.2
ADHD Index***				
Non gambler	87.4	10.1	2.6	12.7
Social gambler[a]	81.8	14.6	3.6	18.2
At-risk gambler[b]	68.3	22.6	9.1	31.7
Probable pathological gambler[c]	50.4	30.1	19.5	49.6
DSM-IV Inattentive***				
Non gambler	85.5	11.7	2.7	14.4
Social gambler[a]	80.4	14.3	5.3	19.6
At-risk gambler[b]	69.4	22.6	8.1	30.7
Probable pathological gambler[c]	54.0	26.5	19.5	46.0
DSM-IV Hyperactive-Impulsive***				
Non gambler	89.3	8.5	2.2	19.2
Social gambler[a]	81.1	15.0	3.9	18.9
At-risk gambler[b]	68.8	22.0	9.1	31.1
Probable pathological gambler[c]	54.9	33.6	11.5	45.1
DSM-IV Total***				
Non gambler	88.1	9.2	2.7	11.9
Social gambler[a]	78.9	16.3	4.9	21.2
At-risk gambler[b]	67.2	22.6	10.2	32.8
Probable pathological gambler[c]	46.0	32.7	21.2	53.9

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (≥ 4).
***Significant differences across gambling groups (p<.001)

Gambling Severity and Social, Emotional, Behavioral, and ADHD Problems

In order to determine whether there were differences in the mean scores of participants across gambling groups a one way analysis of variance (ANOVA) was performed, with each of the 10 CASS:L subscales as the dependent variables and gambling groups as the factor. Results revealed significant group differences for each of the ten subscales (see Tables 25-27).

Levene's test of homogeneity of variances was found to be significant for all subscales *except* the Cognitive Problems, Hyperactivity, DSM:IV: Inattentive, and DSM-IV: Hyperactive Impulsive subtests. Post Hoc comparisons were performed using Tamahane's T2 statistic,

deemed to be appropriate when variances are unequal (results can be seen in Tables B2 and B3, Appendix B).

Table 25: Social, Emotional, and Behavioral Problems as Assessed by the CASS:L

CASS:L Subscales		Gambling Groups			
		Non gambler	Social gambler[a]	At-risk gambler[b]	Probable pathological gambler[c]
	N	*M*	*M*	*M*	*M*
Family Problems					
Male	978	50.26	51.81	53.69	58.40
Female	1321	50.00	51.22	58.89	65.04
Total	2328	50.15	51.46	55.49	59.96
Emotional Problems					
Male	977	51.08	52.29	54.37	56.27
Female	1320	50.80	51.55	56.39	61.64
Total	2326	50.88	51.85	54.88	57.44
Conduct Problems					
Male	977	49.08	53.05	58.24	64.08
Female	1321	50.48	54.52	64.26	73.95
Total	2327	50.12	53.85	60.31	66.40
Cognitive Problems					
Male	978	49.98	50.57	53.07	56.11
Female	1321	50.27	51.23	56.78	61.27
Total	2328	50.21	50.91	54.35	57.36
Anger Control Problems					
Male	978	47.33	49.18	52.13	53.89
Female	1321	47.77	48.88	53.75	58.54
Total	2328	47.71	49.02	52.55	54.96

Note: Subscale scores have a mean of 50 and a standard deviation of 10.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score ($\geq$ 4).

The level of problems appears to increase as gambling severity increases and all groups appear to be significantly different from one another with a few notable exceptions. More specifically, probable pathological gamblers appear to have the most problems as measured by the CASS:L subscales, as youth report significantly higher mean scores. They are significantly different from non, social, and at-risk gamblers on all the subscales, with the exception of Emotional Problems, Cognitive Problems, Anger Control Problems, Hyperactivity, and DSM-IV: Hyperactive Impulsive subscales, where they are *not* different from at-risk gamblers (means can be seen in Tables 25 and 26). The finding that probable pathological and at-risk gamblers have greater cognitive problems than other youth is consistent with previously mentioned results concerning the lower academic achievement and school performance of these youth. Further, while non gamblers have the lowest mean scores across all the groups they do not differ significantly from social gamblers on the Emotional Problems and Cognitive Problems subscales.

Table 26: ADHD and Subtypes as Assessed by the CASS:L

CASS:L Subscales		Gambling Groups			
		Non gambler	Social gambler[a]	At-risk gambler[b]	Probable pathological gambler[c]
	N	*M*	*M*	*M*	*M*
Hyperactivity					
Male	978	47.08	48.41	49.49	52.53
Female	1321	47.20	49.49	54.55	57.32
Total	2328	47.19	48.96	51.25	53.73
ADHD Index					
Male	978	49.73	50.86	53.41	57.65
Female	1321	49.16	50.43	57.91	63.82
Total	2328	49.39	50.60	54.91	59.13
DSM-IV: Inattentive					
Male	978	50.72	52.15	55.20	58.54
Female	1321	48.47	50.43	55.39	60.45
Total	2328	49.15	51.18	55.37	59.17
DSM-IV: Hyperactive-Impulsive					
Male	977	47.50	50.28	53.90	57.29
Female	1321	47.31	50.47	57.37	60.59
Total	2327	47.42	50.37	54.99	58.27
DSM-IV: Total					
Male	977	48.99	51.35	9.53	59.17
Female	1321	47.52	50.52	11.63	62.50
Total	2327	48.01	50.88	55.94	60.19

Note: Subscale scores have a mean of 50 and a standard deviation of 10.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score ($\geq$ 4).

Table 27: ANOVA Table: Gambling Severity Differences on the CASS:L Subscales

CASS:L Subscales	*df, N*	*F*	*p*
Family Problems	3, 2324	49.21	<.001
Emotional Problems	3, 2322	22.91	<.001
Conduct Problems	3, 2323	127.64	<.001
Cognitive Problems	3, 2324	27.97	<.001
Anger Control Problems	3, 2324	33.10	<.001
Hyperactivity	3, 2324	26.11	<.001
ADHD Index	3, 2324	46.68	<.001
DSM-IV: Inattention	3, 2324	44.23	<.001
DSM-IV: Hyperactive Impulsive	3, 2323	62.71	<.001
DSM-IV: Total	3, 2323	65.13	<.001

With respect to gender differences within gambling groups on the CASS: L subscales, the data set was divided by gambling group and Independent samples t-tests for gender were performed on the subscales. Interestingly, gender differences appear to increase as gambling involvement increases. Moreover, females appear to have significantly higher scores, even when covaried for gender, overall, than males (means are presented in Tables 25 and 26). More specifically, with respect to non gamblers, females were found to have significantly higher mean scores on the Conduct Problems subscale, $t(765) = -2.06$, $p < .05$, while males were found to have higher mean scores on the DSM-IV: Inattentive subscale, $t(368.79) = 2.78$, $p < .01$. Of the social gamblers, females were also found to have higher mean scores on the Conduct Problems subscale, $t(1240) = -2.15$, $p < .05$ and on the Hyperactivity subscale, $t(1240) = -2.15$, $p < .05$, while again, males were found to have higher mean scores on the DSM-IV: Inattentive subscale, $t(1077.76) = 2.89$, $p < .01$. Female at-risk gamblers were found to have significantly higher mean scores on the Family Problems, $t(177) = -3.52$, $p < .001$, Conduct Problems, $t(116.94) = -3.23$, $p < .01$, Cognitive Problems, $t(177) = -2.64$, $p < .01$, Hyperactivity, $t(177) = -3.61$, $p < .001$, ADHD Index, $t(177) = -2.87$, $p < .01$, and DSM-IV: Hyperactive-Impulsive, $t(105.13) = -2.07$, $p < .05$, subscales than at-risk males. Female probable pathological gamblers were found to have significantly more Family Problems, $t(109) = -2.80$, $p < .01$, Emotional Problems, $t(109) = -2.05$, $p < .05$, Conduct Problems, $t(109) = -3.46$, $p < .001$, Cognitive Problems, $t(109) = -2.21$, $p < .05$, Hyperactivity, $t(109) = -2.25$, $p < .05$, and ADHD Index, $t(109) = -2.58$, $p < .05$, than males in this group. With respect to developmental differences within gambling groups, the data set was split by gambling groups and a one way analysis of variance was conducted with CASS:L subscales as dependent variables and grade as the independent factor. No notable developmental differences by gambling groups were observed (for means see Tables B4 and B5, Appendix B).

Perceived Social Support

The Perceived Social Support Scale (PSS) consists of two scales, representing perceived social support available from friends and family members. The scales measure perceived social support through items reflecting emotional, informational, feedback, and reciprocal supports. Perceived social support was assessed for both friends and family. Participants positive support responses were given a score of 1 and summed for each scale, with mean scores ranging from 1 to 20, with greater scores being indicative of increased perceived social support. Results for the entire sample revealed that PSS Friend ($M = 12.69$, $SD = 4.79$) was significantly higher that PSS Family ($M = 11.53$, $SD = 5.70$), $t(2328) = 9.20$, $p < .001$.

Significant gender differences on PSS Friend and Family were found with females reporting significantly higher PSS Family ($M = 11.90$, $SD = 5.91$), $t(2299) = -3.51$, $p < .001$, and PSS Friend mean scores ($M = 13.96$, $SD = 4.34$), $t(2304) = -15.26$, $p < .001$, than males ($M = 11.07$, $SD = 5.37$; $M = 10.97$, $SD = 4.83$ respectively). Univariate analyses (ANOVA) examining developmental differences in PSS Friend and Family mean scores, revealed significant trends for PSS Friend, such that perceived social support appears to increase with grade level, $F(6, 2328) = 9.24$, $p < .001$. The reverse trend was noted for PSS Family, such that perceived social support of family significantly decreases with grade level, $F(6, 2322) = 3.33$, $p < .01$.

Table 28: Perceived Social Support

Sample	Perceived Social Support*			
	Friends		Family	
	M	***SD***	***M***	***SD***
Gender				
Male	10.98	4.83	11.07	5.37
Female	13.96	4.34	11.90	5.91
Grade				
7	11.74	4.70	12.30	5.01
8	12.01	4.89	12.00	5.41
9	12.29	4.78	10.74	5.86
10	12.88	4.90	11.03	5.79
11	13.25	4.88	11.63	6.02
12	13.11	4.45	11.14	5.80
13	14.20	4.21	11.65	5.96
Gambling Groups				
Non gambler	12.79	4.95	12.34	5.58
Social gambler[a]	13.00	4.62	11.66	5.65
At-risk gambler[b]	12.07	4.76	9.59	5.89
Probable pathological gambler[c]	11.87	5.10	9.09	5.51

*Range 1-20, the higher the score the more perceived the social support.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score ($\geq$4).

An ANOVA to determine differences in PSS for gambling severity revealed significant differences between the groups on both PSS Friend (F[3, 2324] = 3.89, p<.01) and Family (F[3, 2318] = 20.45, p<.001) scales. Post hoc analyses (Tukey HSD) revealed that social gamblers had significantly higher mean scores on PSS Friend than at-risk gamblers (p<.05); non gamblers and social gamblers had significantly higher mean scores on PSS Family than at-risk and probable pathological gamblers (p<.001) (see Table 28). The finding that probable pathological gamblers had lower perceived social support from peers and family members is consistent with previously mentioned results indicating that they have fewer family members and peers in whom they feel they can confide.

Substance Use and Gambling Amongst Youth

In order to assess participants' use of drugs and alcohol, the Personal Experience Screening Questionnaire (PESQ) was administered. The PESQ assesses three domains related to chemical dependence: *Problem Severity*, *Psychosocial Indicators*, and *Drug Use History*. The Problem Severity Scale provides a global measure of problem severity by reflecting the extent to which the individual is psychologically and behaviorally involved with drugs. High scores suggest symptoms indicating drug dependence and drug use (e.g., use in multiple settings, loss of control, restructuring of activities as to accommodate drug use), while low scores are indicative of relatively infrequent use in limited social settings (Winters, 1992). The Psychosocial

Indicators pertain to personal or environmental problems often associated with adolescent drug use. Items include emotional distress, problems with thinking, and physical and sexual abuse. The Drug Use History section provide a summary of the frequency of alcohol, marijuana, and other drug use during the past 12 months, as well as initial *use* and initial *regular use*.

It is important to note that the PESQ incorporates two validity scales which measure response distortion, specifically tendencies to "fake good" (defensiveness) or "fake bad" (infrequency). High scores on these scales generally indicate a questionable profile and suggest the need for caution in interpreting the participants' responses – particularly those related to Problem Severity. However, these scales were developed for use with clinical populations. The author of the PESQ (K. Winters, personal communication, April 8, 2002) confirmed that the *Defensiveness scale* was not valid for use in a general population and it was recommended not to include this scale to measure response distortion. With respect to the *Infrequency scale*, it was suggested that the criteria for response distortion should be more stringent when applied to the general population. Given the desire to exclude extreme cases of response distortion, the criteria for inclusion were subsequently modified; a positive endorsement on *all* three of the infrequency items was required before the case was excluded (original criteria required a positive endorsement on *any* of the three items). This resulted in nine cases which were eliminated from analyses. It should also be noted that the PESQ was normed for adolescents, 12-18 years of age. Given that this scale was developed for clinical use, it was decided to include 19 year olds in the analyses but to interpret the results with caution.

A Problem Severity Scale mean score was calculated, by summing all items related to problem severity. As noted, higher mean scores are indicative of more serious chemical dependence. According to the PESQ manual (Winters, 1992), participants were classified into high and low risk categories depending upon gender, age, and mean score. A score in the low risk category indicates no problems with alcohol or drug use, while a score in the high risk category (1½ *SD* above the mean of a general school sample) suggests the need for a comprehensive chemical dependency assessment.

Results revealed that 15.8% of the total sample scored in the high risk category indicating that they are psychologically and behaviorally involved with chemicals to a potentially problematic degree. With respect to gender, significantly more males (17.8%) compared to females (14.2%) were classified in the high risk category, $\chi^2(1, N = 2295) = 5.44$, $p<.01$. Developmentally, older children (grades 10–12) were found to be significantly more at-risk than younger children in grades 7-9, $\chi^2(6, N = 2323) = 112.81$, $p<.001$ (see Table 29). Finally, with respect to gambling involvement, the percentage of risk significantly increases with gambling involvement, such that probable pathological gamblers were found to be at greatest risk, $\chi^2(3, N = 2316) = 175.83$, $p<.001$ (Table 29).

Table 29: Substance Use (PESQ), Gender, Developmental and Gambling Severity Differences

Sample	Problem Severity Score		
	At-risk[1]	*M*	*SD*
Gender**			
Male	17.8	24.53	9.98
Female	14.2	23.85	8.54
Grade***			
7	1.7	19.11	3.01
8	8.3	20.98	5.45
9	14.9	23.29	5.52
10	23.8	25.56	10.29
11	22.1	27.15	10.87
12	22.8	27.50	9.93
13	20.5	27.90	10.41
Gambling groups***			
Non gambler	7.7	21.35	7.00
Social gambler[a]	15.4	24.22	8.51
At-risk gambler[b]	31.9	29.61	12.09
Probable pathological gambler[c]	50.9	34.41	13.04

[1]Percentage of participants scoring in the high risk category
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score ($\geq$ 4).
**p<.01. ***p<.001.

Gender, Developmental, and Gambling Severity Differences

A series of ANOVAs and an Independent Samples t-test were conducted in order to assess differences in subscale mean scores on the PESQ. Results revealed no significant gender differences in mean scores, $t(1898.45) = 1.73$, $p = .084$. It should be noted that Levene's test for equality of variances was significant, suggesting unequal variances.
With respect to developmental differences on the problem severity scale of the PESQ, a one way analysis of variance (ANOVA) revealed significantly greater mean scores for older students. In fact, a linear increase by grade level was observed (see Table 29). Levene's test of homogeneity of variances was found to be significant. Therefore, Post Hoc comparisons were performed using the Tamahane T2 statistic, which is a stringent, conservative pairwise test of comparisons and appropriate when the variances are unequal. Results revealed that all grades were significantly different from one another (p<.001) (7 vs. 8 was at p<.05), with the exception of grades 10 vs.11, 10 vs.12, 10 vs.13, 11 vs.12, 11 vs.13, and 12 vs.13. Older adolescents are not significantly different with respect to substance use.

A one way analysis of variance (ANOVA) revealed that severity of problems with substances significantly increases with degree of gambling problems, $F(3, 2315) = 102.53$, p<.001. Levene's test of homogeneity of variances was found to be significant and the null hypothesis of equal variances was rejected, necessitating the use of Tamahane's T2 statistic for post hoc

comparisons. Significant differences between all of the gambling groups with respect to problem severity (substance use) were found. More specifically, there was a linear increase by gambling severity, such that problem severity increased with gambling severity. Probable pathological gamblers had the highest mean scores compared to at-risk ($p<.01$), social ($p<.001$), and non-gamblers ($p<.001$) (Table 29).

Substance Use and History

In addition, the PESQ assesses drug use within the past 12 months and history of use (included are alcohol, marijuana, and hard drugs). Not surprisingly, alcohol was the most frequently used substance, followed by marijuana and hard drugs. No differences were found between excessive alcohol and marijuana use; 6.4% of adolescents reported having used alcohol 40 or more times compared with 5.4% who reported using marijuana with the same frequency (see Table 30). A greater percentage of adolescents reported first getting 'high' in grades 7-8 (10.7%) and 9-10 (13.6%) and first using regularly in grades 9-10 (8.4%) (Table 31).

Table 30: Drug/Alcohol Use within the Past 12 Months: Total Sample

Frequency	Drug/Alcohol Use[1]		
	Alcohol	Marijuana	Hard drugs
Never	30.0	73.9	90.5
1-2 times	21.4	8.6	4.3
3-5 times	13.4	3.6	1.8
6-9 times	10.2	3.1	1.2
10-19 times	11.2	3.0	0.7
20-39 times	7.5	2.5	0.5
40+ times	6.4	5.4	1.1

[1]Percentage.

Table 31: Occasion of First Use and Regular Use: Total Sample

Occasion	Substance Use[1]	
	First got high	First used regularly
Never	68.2	84.5
Grade 6 or before	3.6	0.8
Grade 7-8	10.7	3.7
Grade 9-10	13.6	8.4
Grade 11 or later	3.8	2.6

[1]Percentage.

No significant gender differences were found regarding alcohol use, with the exception of excessive use (40 or more times) (males 8.6%; females 4.6%), $\chi^2(6, N = 2301) = 17.04$, $p<.01$. The same trend was observed for marijuana use, with significantly more males (8.2%) than females (3.3%) reporting excessive use (40 or more times), $\chi^2(6, N = 2300) = 37.16$, $p<.001$. No significant gender differences or trends were noted for hard drug use (see Table B6, Appendix

B). Developmental trends were as expected, with older youth engaging in substance use significantly more often than their younger counterparts (see Table B7, Appendix B).

Significant differences were found with respect to differences in gambling severity regarding alcohol, marijuana, and hard drug use in the past year. Probable pathological gamblers reported a significantly higher percentage of frequent alcohol use (20-40+ times), $\chi^2(18, N = 2325) = 346.79$, $p<.001$, and marijuana use (40+ times), $\chi^2(18, N = 2324) = 172.45$, $p<.001$, than at-risk, social, and non gamblers (see Table 32).

Table 32: Drug/Alcohol Use within the Past 12 Months: Gambling Severity

Gambling Levels	**Frequency[1]**						
Alcohol Use	**Never**	**1-2**	**3-5**	**6-9**	**10-19**	**20-39**	**40+**
Non gambler	47.2	22.1	11.5	7.5	6.5	2.7	2.5
Social gambler[a]	23.5	22.6	14.8	12.0	13.2	8.1	5.7
At-risk gambler[b]	14.0	17.7	15.1	9.1	13.4	14.0	16.7
Probable pathological gambler[c]	8.8	9.7	8.0	10.6	16.8	23.0	23.0
Marijuana Use							
Non gambler	85.5	5.4	1.9	1.7	1.2	1.7	2.6
Social gambler[a]	71.9	9.7	4.2	3.5	3.5	2.6	4.6
At-risk gambler[b]	55.4	11.8	5.4	4.8	5.4	3.8	13.4
Probable pathological gambler[c]	46.9	12.4	4.4	5.3	6.2	4.4	20.4
Hard Drug Use							
Non gambler	95.9	1.4	0.9	0.6	0.1	0.3	0.8
Social gambler[a]	90.6	4.9	1.8	1.1	0.9	0.2	0.6
At-risk gambler[b]	80.6	8.6	1.6	1.6	1.6	1.6	4.3
Probable pathological gambler[c]	68.1	9.7	8.8	4.4	0.9	3.5	4.4

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score ($\geq$ 4).

There were no differences between probable pathological and at-risk gamblers' excessive usage (40+ times) of hard drugs; however, both groups differed significantly in reported percentage of use between social and non gamblers, $\chi^2(18, N = 2325) = 159.05$, $p<.001$ (Table 32). It should be noted that when the results were further analyzed by gender, males and females did not differ significantly from each other in any of the groups with the exception of marijuana use for social gamblers, $\chi^2(6, N = 1240) = 19.15$, $p<.01$, with males reporting significantly more regular use (40+ times) (7.1%) than females (2.6%) during the past 12 months (Tables B8-B10, Appendix B).

Psychosocial Indicators

The PESQ includes questions considered to be psychosocial indicators of stress. These indicators may be indicative of problems in participants' backgrounds unrelated or in addition to drug abuse. Items reflect emotional distress (e.g., worry a lot about things for no reason), thought problems (e.g., bothered by unusual thoughts), and abuse (physical and sexual). Of the total sample, 74.2% reported experiencing one or more symptoms of psychological distress, 50.2% reported having thought problems, and 18.6% reported being victims of physical or sexual abuse. The distribution of the total sample can be seen in Table 33.

Table 33: Psychosocial Indicators: Gender Differences and Overall

Psychosocial Indicators	Gender[1]		
	Male	**Female**	**Total**
Psychological Distress			
I worry a lot about little things, or for no reason***	50.2	67.4	60.0
I feel sad blue or depressed much of the time***	21.0	29.3	25.8
I often suffer from headaches or a nervous stomach***	29.2	44.1	37.8
I think about killing myself*	16.5	20.3	18.7
Thought Problems			
I am bothered by unusual thoughts	43.4	42.1	42.5
There is something wrong with the way my mind works***	26.2	19.8	22.5
Abuse			
Someone in my family hits me when they are angry	14.5	14.5	14.5
I am afraid of someone because they have been sexual with me**	4.3	7.4	6.2

[1]Percentage.
*$p<.05$. **$p<.01$. ***$p<.001$.

Females were found to have significantly more psychological distress than males including anxiety, $\chi^2(1, N = 2303) = 69.35$, $p<.001$, depression, $\chi^2(1, N = 2298) = 20.42$, $p<.001$, psychosomatic complaints, $\chi^2(1, N = 2300) = 53.58$, $p<.001$, and suicide ideation, $\chi^2(1, N = 2288) = 5.40$, $p<.05$. No gender differences were found regarding unusual thoughts, however, significantly more males believe that there is something wrong "with the way their mind works", $\chi^2(1, N = 2294) = 13.02$, $p<.001$. Males and females reported an equal percentage of physical abuse, with females reporting significantly more sexual abuse, $\chi^2(1, N = 2296) = 9.29$, $p<.01$ (Table 33).

Regarding gambling group differences in psychosocial distress, an increasing linear trend was observed such that significantly more probable pathological gamblers reported depression, $\chi^2(3,$

$N = 2321$) = 22.62, $p<.001$, psychosomatic complaints, $\chi^2(3, N = 2322) = 18.01$, $p<.001$, and suicide ideation, $\chi^2(3, N = 2310) = 52.40$, $p<.001$, than at-risk, social, or non-gamblers. Additionally, it appears as though at-risk gamblers are reporting these symptoms significantly more than social and non gamblers. At-risk and probable pathological gamblers reported significantly more thought problems, including unusual thoughts, $\chi^2(3, N = 2319) = 14.77$, $p<.01$, and feeling that there is something wrong with the way their mind works, $\chi^2(3, N = 2316) = 90.29$, $p<.001$. These two groups also reported significantly more physical, $\chi^2(3, N = 2322) = 53.63$, $p<.001$, and sexual abuse, $\chi^2(3, N = 2318) = 24.14$, $p<.001$, than non and social gamblers (Table 34). Gender differences within the gambling groups can be found in Table B11, Appendix B.

Table 34: Psychosocial Indicators: Gambling Severity

Psychosocial Indicators	Gambling Groups[1]			
	Non gambler	**Social gambler[a]**	**At-risk gambler[b]**	**Probable pathological gambler[c]**
Psychological Distress				
I worry a lot about little things, or for no reason	60.1	59.9	61.3	58.4
I feel sad blue or depressed much of the time**	23.6	24.6	33.0	41.6
I often suffer from headaches or a nervous stomach**	33.6	38.8	40.5	53.1
I think about killing myself**	14.3	17.9	31.7	36.0
Thought Problems				
I am bothered by unusual thoughts**	39.6	42.0	51.4	54.0
There is something wrong with the way my mind works***	15.4	22.4	38.0	48.2
Abuse				
Someone in my family hits me when they are angry***	11.7	12.8	27.7	29.2
I am afraid of someone because they have been sexual with me***	5.3	5.3	11.4	14.4

[1]Percentage.
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score ($\geq$ 4). [d]or learning problem.
**$p<.01$. ***$p<.001$.

Hierarchical Cluster Analyses

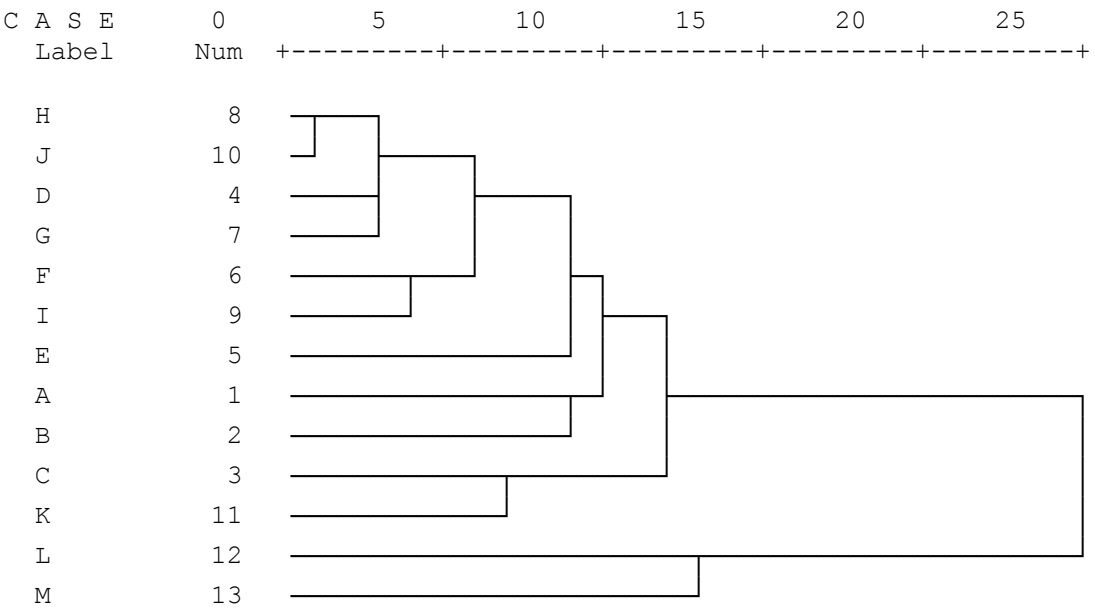
Hierarchical Cluster Analyses identify homogenous subgroups of variables within a given population. As such, cluster analysis seeks to identify a set of groups which both minimize within-group variation and maximize between-group variation. This method produces a correlation matrix as well as a dendogram (tree diagram) representing the results. Cases having high similarity are adjacent to one another in the dendogram. More specifically, for this study a hierarchical cluster procedure was selected, with the clusters being nested rather than mutually exclusive. Thus, larger clusters may contain smaller clusters. The measures included in the cluster analysis were the dependent variables of interest. A Pearson correlation proximity matrix was generated and analyzed using the between-groups linkage (average) as the cluster method. This method is preferred as it considers information about all pairs of distances in forming clusters, not just the closest and farthest. Results of the dendogram (tree diagram) can be seen in Figure 2 with the correlation matrix presented in Table 35.

Based upon the results of the Cluster Analysis, several variables, which were not largely correlated with one another, were selected for the Logistic Regression. These included the CASS:L subscales of Family Problems, Emotional Problems, Conduct Problems, Anger Control Problems, Hyperactivity, DSM-IV: Inattentive, the PSS Friends and Family subscales, and the Problem Severity Scale of the PESQ.

Table 35: Proximity Matrix: Pearson Correlations

	A	B	C	D	E	F	G	H	I	J	K	L
A												
B	.526											
C	.494	.330										
D	.456	.522	.490									
E	.442	.466	.533	.445								
F	.424	.423	.486	.560	.507							
G	.715	.648	.553	.799	.588	.606						
H	.471	.511	.507	.810	.450	.581	.755					
I	.435	.394	.589	.587	.503	.751	.624	.619				
J	.507	.507	.610	.782	.532	.740	.770	.902	.895			
K	.266	.170	.630	.261	.250	.235	.282	.281	.322	.335		
L	-.155	-.232	-.014	-.161	-.145	-.055	-.210	-.215	-.007	-.126	.089	
M	-.600	-.351	-.340	-.316	-.266	-.271	-.464	-.351	-.260	-.341	-.215	.330

Note: A (Family Problems), B (Emotional Problems), C (Conduct Problems), D (Cognitive Problems), E (Anger Control Problems), F (Hyperactivity), G (ADHD Index), H (DSM-IV: Inattentive), I (DSM-IV: Hyperactive-Impulsive), J (DSM-IV: Total), K (Problem Severity Scale), L (PSS Friend), M (PSS Family)



Note: A (Family Problems), B (Emotional Problems), C (Conduct Problems), D (Cognitive Problems), E (Anger Control Problems), F (Hyperactivity), G (ADHD Index), H (DSM-IV: Inattentive), I (DSM-IV: Hyperactive-Impulsive), J (DSM-IV: Total), K (Problem Severity Scale), L (PSS Friend), M (PSS Family)

Figure 2. Dendogram from Cluster Analysis

Logistic Regression

Binary logistic regression is used when the dependent measure is dichotomous and the independent variables are continuous, categorical, or both. The logistic regression procedure was selected as it does not assume linearity of relationship between the independent variables and the dependent measure, it does not require normally distributed variables, fails to assume homeoscedasticity, and has generally less stringent requirements. All regression analyses were performed with a training sample in order to cross validate the results. The regression equation was developed from a portion of the sample and then applied to the remainder of the sample. This was accomplished by splitting the sample into two subsamples: (1) 60% of the sample, and (2) 40% of the sample. The model was developed on the training sample (60%) and validated on the validation sample (40%) (which was not included in the development of the model). This procedure is also known as a Hold-Out Sample (Tabachnick & Fidell, 2001). This enabled the generalizability of the results to the population.

Probable Pathological Gamblers

Several essential steps were involved in the Logistic Regression. First, the logistic regression was performed with the aforementioned selected variables (CASS:L subscales of Family Problems, Emotional Problems, Conduct Problems, Anger Control Problems, Hyperactivity, DSM-IV: Inattentive, the PSS Friends and Family scales, and the Problem Severity Scale of the PESQ) as the covariates along with gender and grade as categorical covariates and probable

pathological gambling as the dependent variable (i.e., dichotomous variable with probable pathological gamblers receiving a 1 and the rest of the sample a 0) using the *enter* method (i.e., the variables are entered in a single step without checking any of the entry criteria except tolerance) (Tabachnick & Fidell, 2001). It should be noted that this procedure was performed on both an unweighted sample and on a sample with a weight of 2. This weight was selected in order to increase the size of the probable pathological gambling group in comparison to the proportion of individuals not in that group (as it was originally 113 vs. 2215). The weights served to equalize the groups; such the each PPG was represented twice. Results for both the weighted and unweighted models revealed that several variables should be retained (on the basis of the significance of the Wald statistic). Independents were dropped from the model when their effects were not significant. It should be noted that no differences were found between the weighted and unweighted models in terms of statistical significance. Further, all parameters (B) were in the same direction. Thus, it was determined that a model with a weight of 2 was perceived to be conservative and could be employed to select predictor variables (see Table B12, Appendix B for results for the unweighted model).

As can be seen in Table 36, the variables to be retained, termed Model 1, are Family Problems, Conduct Problems, Anger Control Problems, Problem Severity, and Gender. The odds ratio [Exp(B)] is a measurement of relative risk when directionality is determined. For example, these results suggest that the odds of being a probable pathological gambling problem are approximately 1.1 times greater for individuals with family problems, conduct problems, and chemical dependency. The odds of becoming a probable pathological gambler are approximately 24 times greater for males. The omnibus test of model coefficients is a chi-square test which tests the null hypothesis that all population logistic regression coefficients, except the constant, are zero. For the current model, the null hypothesis is rejected, $\chi^2(16, N = 2328) = 163.62$, $p<.001$, indicating that the coefficients *are* significantly different from zero. As a result, the model is considered to be sufficiently good in predicting the dependent variable based upon the independent variables selected.

Table 36: Logistic Regression: Model 1 (Enter Method, Weight 2)

Variable	B	S.E.	Wald	*df*	*p*	Exp(B)
Family Problems*	.075	.030	6.128	1	.013	1.078
Emotional Problems	-.001	.027	.001	1	.979	.999
Conduct Problems*	.090	.025	12.418	1	.000	1.094
Anger Control Problems*	-.056	.028	3.937	1	.047	.945
Hyperactivity	.032	.030	1.169	1	.280	1.033
DSM-IV: Inattentive	.017	.024	.462	1	.497	1.017
PSS Friend	-.011	.049	0.51	1	.822	.989
PSS Family	.028	.041	.475	1	.491	1.029
Problem Severity*	.048	.019	6.319	1	.012	1.049
Grade	-	-	6.877	6	.332	-
Gender*	3.190	.546	34.157	1	.000	24.278

Note: B = Parameters, Exp(B) = odds ratio. *variables to be retained.

Second, a backward stepwise logistic regression analysis (weight 2) was performed in order to assess prediction of membership into the group of probable pathological gamblers. Results generated a good model fit at step 7 on the basis of four predictor variables, identified as Model 2: Family Problems subscale (CASS:L), Conduct Problems subscale (CASS:L), Problem Severity scale (PESQ), and gender. This model was able to correctly classify 80.3% of non probable pathological gamblers and 80.6% of probable pathological gamblers. The validation sample was used to test the current model; the results of this model being able to predict 83.5% of individuals not in the specified group and 74.5% of probable pathological gamblers in the validation sample. The omnibus test enabled a rejection of the null hypothesis, $\chi^2(4, N = 2328) = 150.00$, $p<.001$, indicating that the coefficients are significantly different from zero. Model 2 appears to be able to adequately predict problem gamblers in the population. In comparison to Model 1, Model 2 does not retain the variable Anger Control Problems.

Table 37: Logistic Regression: Model 2 (Backward Stepwise, Weight 2)

Variable	B	S.E.	Wald	*df*	*p*	Exp(B)
Family Problems	.067	.022	9.356	1	.002	1.069
Conduct Problems	.075	.021	12.323	1	<.001	1.078
Problem Severity	.053	.018	8.951	1	.003	1.054
Gender	3.091	.489	39.986	1	<.001	21.997

Based on an examination of the both the weighted and unweighted statistics, the decision was made to drop Anger Control Problems from the model, as its Wald statistic was only nearing significance in the weighted Model 1 and was not significant in the unweighted Model 1. As a precaution, Model 1 was re-analyzed using the *enter* method, with only the 5 retained variables (non weighted and weighted). Results revealed that the Wald statistic for Anger Control Problems was not significant for Model 1 on the non weighted and weighted samples. Thus, confirmation for dropping this variable was acquired.

The third step in the regression involved re-running the logistic regression with the retained variables: Family Problems subscale (CASS:L), Conduct Problems subscale (CASS:L), Problem Severity scale (PESQ), and gender, as the final model. The model was run using the *enter* method with three different weightings: non weighted, weight of 2, and weight of 5. It should be noted that no differences were found between the weighted and non weighted models in terms of the statistical significance. Further, all parameters (B) were going in the same direction. In fact, the parameters for the model with weights 2 and 5 were nearly identical. Thus, it was determined that a model with a weight of 5 would be employed to report significance as it is more robust given the larger N. The results of this analysis can be seen in Table 38 (see Tables B13 & B14, Appendix B for results for the unweighted and weight 2 models).

Table 38: Logistic Regression: Final Model (Weight 5)

Variable	B	S.E.	Wald	*df*	*p*	Exp(B)
Family Problems	.066	.014	23.365	1	<.001	1.068
Conduct Problems	.075	.013	31.049	1	<.001	1.077
Problem Severity	.053	.011	22.796	1	<.001	1.054
Gender	3.080	.307	100.791	1	<.001	21.750

Results generated a good model fit on the basis of four predictor variables in the Final Model: Family Problems subscale (CASS:L), Conduct Problems subscale (CASS:L), Problem Severity scale (PESQ), and gender. This model was able to correctly classify 80.3% of gamblers not in the specified group and 80.6% of probable pathological gamblers. The validation sample was used to test the current model; the model was able to predict 83.7% of individuals not in the specified group and 74.5% of probable pathological gamblers in the validation sample. Accordingly, the odds of developing a probable pathological gambling problem are approximately 1.1 times greater for individuals with family problems, conduct problems, and chemical dependency, and approximately 22 times greater for males. Furthermore, the adjusted R^2 was found to be 0.591. Thus, the final model accounts for 60% of the variance in the criterion variable. The model chi-square indicates how well the model fits the data. The chi-square results for the current model, $\chi^2(4, N = 2328) = 378.237$, $p<.001$, indicate that the variables allow better prediction of probable pathological gambling than without the variables. The Hosmer and Lemeshow Goodness of Fit test divides subjects into deciles based on predicted probabilities and then computes a chi-square from observed and expected frequencies. It should be noted that great importance should not be placed on this statistic (E. Hadaya, personal communication, May 2, 2002) for several reasons. Firstly, the model was developed on a training sample and validated on a validation sample. Secondly, a ROC Curve graph and statistics were obtained in order to ensure that the model is not *overfitting* the data and that the model is indeed a good model (results presented below).

Results based upon the Hosmer and Lemeshow statistic for the weighted (5) final model, $\chi^2(3, N = 2328) = 22.813$, $p<.001$, were significant, indicating no difference between the observed and predicted values of the dependent variable. However, the statistical significance results from the weights that were placed on the sample. Because a weight of 5 was assigned, each PPG is represented 5 times in the sample. The numbers in each cell are larger and thus differences between the observed and expected values are larger. If we examine the Hosmer and Lemeshow statistic for the non weighted final model, $\chi^2(8, N = 2336) = 9.956$, $p=.268$ we can see that the final model provides adequate fit since $p>.05$.

The Receiver Operating Characteristics (ROC) Curve is often used with a logistic regression model as an indication of the capability of the model to predict future outcomes. The ROC Curve is a graphical representation of the trade off between false negative and false positive rates. The closer the ROC Curve is to the upper left hand corner of the graph, the better the results. The area under the curve is important and for the particular regression model was equal to .881 (Figure 3). The ROC curve was graphed for the validation and training samples as well. Results indicated that the area under the curve was .861 for the validation sample and .895 for the

training sample, indicating that the model is not *overfitting* the data and that the final model is the best predictor of probable pathological gambling.

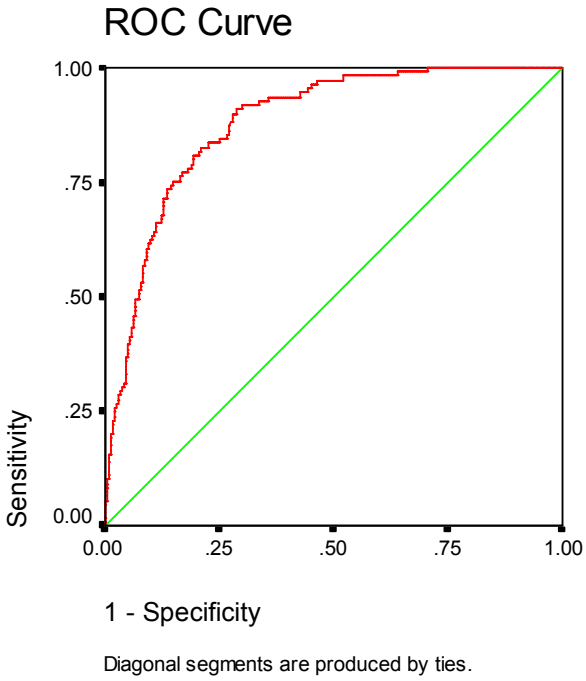


Figure 3. Roc Curve: Final Model for the Probable Pathological Gamblers

At-Risk and Probable Pathological Groups Combined

Another set of logistic regression analyses were performed combining the at-risk and probable pathological gamblers as a single group. The purpose was to determine whether at-risk gamblers were similar to probable pathological gamblers. Researchers have hypothesized that at-risk gamblers have similar psychological characteristics to probable pathological gamblers and that a proportion of at-risk gamblers transition quickly to PPGs (Gupta & Derevensky, 1998a. 1998b). At-risk and PPGs were given a 1 and the rest of the sample a 0. The regression steps involved in selecting a model was conducted exactly as reported above (for results depicting the *enter* method and stepwise regressions see Tables B15 & B16, Appendix B). The models were based on the same group of initial variables selected from the output of the hierarchical cluster analysis (the CASS:L subscales of Family Problems, Emotional Problems, Conduct Problems, Anger Control Problems, Hyperactivity, DSM-IV: Inattentive, the PSS Friends and Family scales, and the Problem Severity Scale of the PESQ) as well as grade and gender as categorical covariates and the at-risk/problem group as the dependent variable. Thus, for brevity, only the results of the Final Model will be reported.

In the final step in determining the model, the logistic regression was performed with the retained variables which ended up being the same as the probable pathological gambling group: Family Problems subscale (CASS:L), Conduct Problems subscale (CASS:L), Problem Severity subscale (PESQ), and gender, as the final model. The model was computed using the *enter*

method with three different weightings: non weighted, weight of 2, and weight of 5. It should be noted that no differences were found between the weighted and non weighted models in terms of the significance of the Wald statistic. Further, all parameters (B) were going in the same direction. In fact, the parameters for the model with weights 2 and 5 were nearly identical. Thus, it was determined that a model with a weight of 5 would be employed to report significance as it is more robust given the larger N. These results are found in Table 39.

Table 39: Logistic Regression for At-Risk/PPG Groups Combined: Final Model (Weight 5)

Variable	B	S.E.	Wald	*df*	*p*	Exp(B)
Family Problems	.060	.014	18.974	1	<.001	1.062
Conduct Problems	.083	.014	35.673	1	<.001	1.087
Problem Severity	.057	.012	22.649	1	<.001	1.058
Gender	3.013	.298	102.257	1	<.001	20.357

Results generated a good model fit on the basis of four predictor variables in the final Model: Family Problems subscale of the CASS:L, Conduct Problems subscale of the CASS:L, Problem Severity scale of the PESQ, and gender. This model was able to correctly classify 80.1% of gamblers not in the specified group and 85.0% of at-risk/probable pathological gamblers. The validation sample was used to test the current model. The results suggest the model was able to predict 82.2% of individuals not in the specified group and 76.3% of at-risk/probable pathological gamblers in the validation sample. According to this model, the odds of becoming an at-risk/probable pathological gambler are approximately 1.1 times greater for individuals with family problems, conduct problems, and chemical dependency, and approximately 20 times greater for males. Furthermore, the adjusted R^2 was found to be 0.610, meaning that the final model accounts for 61% of the variance in the criterion variable. The chi-square for the current model, $\chi^2(4, N = 2328) = 395.024$, $p<.001$, indicates that the variables allow better prediction of at-risk and probable pathological gambling than by chance. The Hosmer and Lemeshow Goodness of Fit test, divides adolescents into deciles based on predicted probabilities, and computes a chi-square from observed and expected frequencies. As previously mentioned, great importance should not be placed on this statistic (Elias Hadaya, personal communication, May 2, 2002). Results revealed that the Hosmer and Lemeshow statistic for the weight 5 final model, $\chi^2(3, N = 2328) = 18.404$, $p<.001$, was significant, indicating no difference between the observed and predicted values of the dependent variable. However, significance can result from the weights that were placed on the sample (i.e., each PPG is represented 5 times in the sample). The numbers in each cell are amplified, thus differences between the observed and expected values are larger. If we examine the Hosmer and Lemeshow statistic for the non weighted final model, $\chi^2(8, N = 2336) = 14.931$, $p=.061$, we can see that the final model provides adequate fit since $p>.05$.

The ROC Curve was plotted for the final regression model conducted with the combined at-risk/probable pathological gambling group. The area under the curve was found to be .818 (see Figure 4).

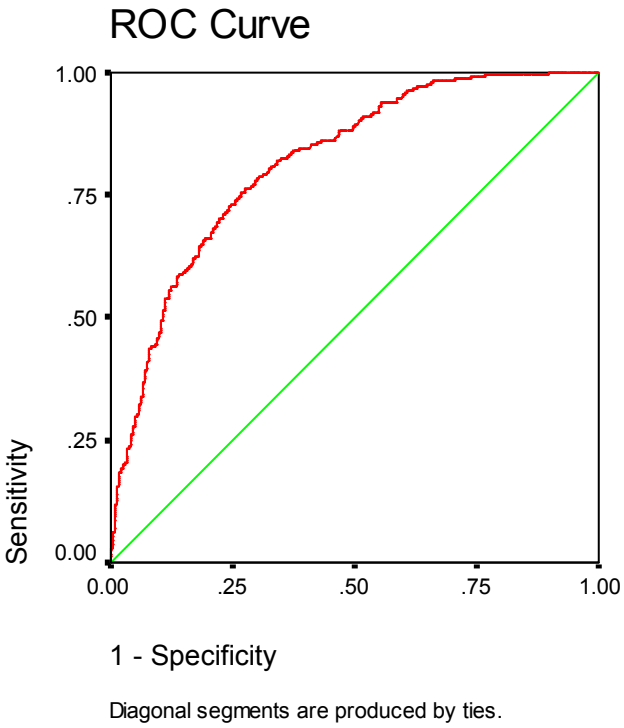


Figure 4. Roc Curve: Final Model for the At-Risk/Probable Pathological Gambling Groups Combined

The ROC curve was graphed for the validation and training samples as well. Results indicated that the area under the curve was .794 for the validation sample and .833 for the training sample, suggesting that the final model is not *overfitting* the data and is the best predictor of at-risk/probable pathological gambling.

SUMMARY AND CONCLUSIONS

The present study empirically examined the relationship between several risk and protective variables associated with adolescent gambling. More specifically, the relationship between familial, emotional, social, and behavioral variables and youth gambling problems were investigated. The results revealed that a large percentage of youth reported gambling within the past year (66%) and on a regular basis (20%).

Gambling involves risk-taking, may involve some skill, and may best be conceptualized on a continuum ranging from non-gambling, to social and recreational gambling, to problem gambling (at-risk gambling), and to pathological gambling. Pathological gambling is characterized by a continuous or periodic loss of control over gambling, a preoccupation with gambling and obtaining money with which to gamble, irrational thinking, and a continuation of the behavior despite adverse consequences.

With respect to problem gambling, 4.9% of adolescents were found to have a probable pathological gambling problem with 8.0% being classified as at-risk gamblers, while the vast majority of youth were found to be either non gamblers (33.3%) or social gamblers (53.9%). However, these findings are consistent with previous research (Adalf & Ialomiteau, 2000; Derevensky & Gupta, 2000a; NRC, 1999; Shaffer & Hall, 1996; Shaffer & Korn, 2002; Ste-Marie, 2001). These results contrast recent surveys also conducted in Ontario, which found slightly lower prevalence rates for probable pathological gambling (2.8%) using the same gambling screen (DSM-IV-MR-J) (Derevensky & Gupta, 2001; Gupta & Derevensky, 2001). Perhaps these differences may be attributed to regional divergence, school, or sampling bias. Nonetheless, a significant number of adolescents under the age of 19 are gambling and experiencing serious gambling related problems. Such results are particularly concerning given the legal age for gambling in Ontario is 19.

Males were found to be more likely to gamble and to have gambling associated problems than females (e.g., more males were found to be at-risk and probable pathological gamblers). Gambling and problem gambling was found to increase with grade level, with students in grade 13 having the highest rates of at-risk and probable pathological gambling. It would appear as though gambling and gambling severity increases with age; however it is uncertain whether this is the result of a cohort effect, or a cumulative developmental effect. It is unclear whether gambling increases as a function of age (as children get older gambling and problem gambling increases) or whether increases are the result of a group of children having longer exposure to gambling (e.g., grade 13 students may have, as a group, had the most exposure to gambling activities).

Gambling Activities

Overall, the most popular gambling activities engaged in on a regular basis (once a week or more) were found to be cards, sports pools, games of skill, and the lottery. With respect to gambling severity, probable pathological gamblers reported engaging in all activities more than at-risk and social gamblers, with their top three preferred activities being cards, sports pools, and

games of skill, with the lottery being a close fourth. At-risk gamblers were found to prefer cards, sports pools, games of skill, and the lottery. However, if sports lottery and lottery draws are combined, the lottery is the most preferred gambling activity for both at-risk and probable pathological gamblers.

An emerging issue in the field of gambling and youth gambling is internet gambling for money (requiring a credit card). Prior research has not questioned youth regarding internet gambling *without* money. The finding that internet gambling *without* money is a very popular activity for adolescents both with gambling problems (probable pathological gamblers 25%; at-risk gamblers 20.4%) and without gambling problems (6.3%) is of interest. In order to gamble on the internet for money, a credit card is required; something which few adolescents possess. Perhaps internet gambling without money is a gateway to other types of gambling, primarily internet gambling for money, at a later time. Research is clearly needed to investigate the appeal of internet gambling amongst adolescents.

Academic Factors

Academic achievement and investment in school have often been cited as being protective factors against the development of psychopathology (Jessor et al., 1995; Luthar et al., 2000). Thus, it would be expected that probable pathological gamblers would have lower overall academic achievement and increased incidence of learning problems or learning disabilities. A significantly higher percentage of probable pathological gamblers reported having been diagnosed with a learning disability (22.3% vs. 9.0% other youth), classified themselves as slow learners (16.8% vs. 7.3% other youth), and reported lower overall grade averages (M = 69.50 vs. M = 76.68 other youth) compared to non and social gamblers. In addition, significantly fewer individuals in this group reported that they do well (academically) in school (54.9% vs. 81.6% other youth). Probable pathological gamblers also reported that they are 'bothered by unusual thoughts' and 'feel that there is something wrong with the way their mind works,' significantly more often than other adolescents. Interestingly, the thought problems reported by probable pathological and at-risk gamblers appear to be related to diminished academic achievement and learning problems. In addition, significantly more probable pathological gamblers (42.5%) scored in the clinical range ($\geq$ 60) on the Cognitive Problems-Inattention subscale of the CASS:L and demonstrated significantly higher mean scores (M = 57.36 vs. M = 50.95 other youth) than other adolescents. These individuals may be inattentive which results in impaired cognitive processing. They report having more academic difficulties than individuals their age, have problems organizing and completing tasks, and have particular difficulty concentrating on work that requires mental effort. It should be noted that when controlling for ADHD (i.e., probable pathological gamblers with and without ADHD were examined), no notable differences were observed regarding academic and learning difficulties.

While it appears that strong academic achievement can potentially be a protective factor against the development of gambling and related problems, it remains unclear whether poor academic achievement is a result or a precursor to problem gambling. For example, an adolescent may be experiencing learning difficulties, which leads to frustration and a sense of failure, and subsequently may be unable to deal with school-related stress. For these youth, gambling may be

adopted as a coping strategy (albeit a poor strategy) and an escape. An alternative possibility is that an adolescent with probable pathological gambling problems is so involved with gambling that one of the consequences of their involvement is missing school, resulting in poor academic performance. In this case the adolescent may be so preoccupied with their gambling that he/she is unable to focus and concentrate, resulting the appearance of a learning disability or attentional problem. As both these scenarios are plausible, further research is needed in this area in order to investigate the relationship between academic problems and gambling behavior. Nonetheless, these findings suggest that learning difficulties are an important risk factor for the development and maintenance of gambling and related problems. Still further, past research has found school connectedness to be a protective factor against every health risk behavior measure (Resnick et al., 1997). Academic performance, school bonding (perceived connectedness with school) and school policies have also been found to either shield risk factors of substance abuse or are antecedents to unsuccessful coping and the development of substance abuse (Dickson et al., in press-a). As such, prevention efforts need to incorporate the enhancement of school involvement and connection.

Psychosocial Indicators, Psychopathology, and Gambling

Probable pathological and at-risk gamblers reported significantly more symptoms of psychological distress including depression, psychosomatic complaints, and suicide ideation. They also report significantly more thought problems as well as physical and sexual abuse. Thus, it appears as though probable pathological gamblers and at-risk gamblers (albeit to a lesser degree) are experiencing a wide range of psychological problems. Moreover, probable pathological gamblers reported significantly more emotional problems, such that they had higher mean scores ($M = 57.44$ vs. $M = 51.76$ other youth) and were more likely (41.6%) to be classified in the clinical range (≥ 60) than other adolescents (41.6%). High scores on this scale reflect low self-esteem and low self-confidence. These individuals are likely to feel lonely and isolated, and generally have more worries and concerns than adolescents their age. Such findings are similar to previous studies which have indicated that youth with gambling problems experience lower self-esteem (Gupta & Derevensky, 1998b), depression (Getty et al., 2000; Gupta & Derevensky, 1998a, 1998b; Kaufman et al., 2001; Marget et al., 1999; Nower et al., 2000), emotional problems (Gupta & Derevensky, 2000) and have increased rates of suicide ideation and attempts (Gupta & Derevensky, 1998a; Ladouceur et al., 1994; Lesieur et al., 1991). Further, these findings provide preliminary support for Jacobs (2002) who noted that addicted adults reported significantly more incidence of trauma and abuse than the general population. Continued gambling may appear to help adolescents cope with the myriad of difficulties they are experiencing. Support for this comes from research suggesting that gambling is engaged in to relieve depression, anxiety, and help cope with a low self-esteem (Gupta & Derevensky, 2000; Kaufman et al., 2001; Ohtsuka et al., 1997).

Perceived Social Support and Social Factors

Consistent with previous findings, overall mean scores for perceived social support for friends were greater than for family (Averna & Hesselbrock, 2001). Females, in general, were found to have higher perceived social support from both friends and family members than males. Family

PSS scores decreases with age and Friend PSS scores increases with age, such that as children get older they report less perceived social support from their family but more from their friends. Adolescents have been found to place more importance on peer relationships than family relationships, leading many to conclude that perceived support from friends may be more influential on adolescent behavior than perceived support from family (e.g., Brown, 1990; Ohanessian & Hesselbrock, 1993).

Probable pathological and at-risk gamblers appear to have decreased perceptions of social support from both friends and family. Thus, it appears that lack of perceived social support may be a risk factor for the development of gambling related problems. High perceived family and peer support appear to be protective factors against the development of gambling problems. Social support has been identified as a possible protective factor against the development of substance use problems, particularly for individuals with a family history of substance use (Kandel & Andrews, 1987; Wills & Cleary, 1996). This is predominantly true for family support; close, supportive family relationships have been linked with lower drug and alcohol use (Brook et al., 1990). The literature on social support and substance use has found that close friendship support and social support increase the risk for adolescent substance initiation and use (McCubbin et al., 1985). Based on the current results, this does not appear to hold true for gambling, such that probable pathological gamblers reported lower perceived social support. In the case of the present study, the perceived social support by peers appears to be a protective factor. Jessor et al. (1995) found that direct initiation or encouragement (e.g., lacking the resources to cope with difficulty or modeling and influence from peers), and greater accessibility and opportunity to engage in problem behavior (e.g., antisocial peer group) contributed to the development of risk behaviors. In an investigation of the relationship of psychosocial protective variables to involvement in problem behavior (alcohol and drug abuse, delinquency, and sexual precocity), the most influential risk factor was found to be a measure of instigation in the perceived social environment, (e.g., friends as models for problem behavior). Thus, peers appear to be a large factor in the development and maintenance of risky behaviors, particularly addiction.

Adolescent probable pathological gamblers, reported perceiving more peers, particularly friends as having gambling problems and substance abuse problems than the other three gambling groups. They also report knowing more people (e.g., classmate) who have gambling and substance abuse problems. These findings are consistent with the literature indicating that gambling and substance use and abuse is part of the peer culture (Griffiths, 1990; Hardoon & Derevensky, 2001; McCubbin et al., 1985). However, what is unclear is whether individuals seek out peers with similar interests with whom to engage in these activities, or whether peer pressure is a precipitating factor in the development of these behaviors. Perhaps sociological theory, namely the *consciousness of kind*, can help explain the current findings. This theory holds that individuals participate and relate to peer groups and activities with similar interests, values, and beliefs. Similarity and peer affiliation appears to be an important construct in the development of risk behaviors.

Results also revealed that close confidantes significantly decreased as gambling severity increased, with probable pathological and at-risk gamblers reporting having fewer individuals

with whom they could confide. These youth also report having difficulty confiding in their friends and parents. Interestingly, when asked about the number of personal friends and satisfaction with their social life, probable pathological gamblers reported having more friends in general, but no differences were reported with respect to social life satisfaction. These findings are interesting and generate speculation. Perhaps adolescents who are at-risk or those experiencing significant gambling-related problems have many friends and a large peer group, but those friends are not ones whom they can count on and confide in. Rather, these individuals appear to be more like 'gambling associates' than friends.

Fewer probable pathological gamblers reported belonging to a religious organization (e.g., no group differences were found regarding involvement in a community centre, scouts/guides, or 'other' social groups). However, a greater percentage of at-risk and probable pathological gamblers reported belonging to a sports team. Past research has suggested that belonging to a community group is one of the strongest protective factors against both internalizing and externalizing/acting out behaviors (Resnick et al., 1993). The current results failed to support this finding, with almost no gambling group differences in community involvement with respect to gambling. Perhaps many community groups were more sports oriented rather than youth group oriented. In addition, what was not assessed was the investment of participants in these activities. Adolescents reported that they participated in certain organized activities, but the extent of their involvement is not known.

Familial Factors

Youth who report having family problems and perceive their families to be unsupportive appear to be at an increased risk for the development of gambling problems. A significantly greater percentage of probable pathological gamblers (49.5%) and at-risk gamblers' (30.1%) mean scores were classified in the clinical range ($\geq$ 60) compared to non gamblers and social gamblers on the CASS:L. Probable pathological gamblers, and to a lesser extent at-risk gamblers, are experiencing significant familial problems. They likely perceive their parents and other family members as uncaring, harsh, or overly critical, and they may also feel emotionally detached or distant from family members. Further, probable pathological and at-risk gamblers appear to have decreased perceptions of social support from their family. Thus, the family appears to be a critical factor in the development and maintenance of gambling behavior.

The family appears to play another role in the development of gambling behavior. Parental involvement in gambling or other substances has been consistently linked to youth participation. Results revealed that adolescent at-risk and probable pathological gamblers reported perceiving significantly more family members as having gambling problems and substance abuse problems than non gamblers and social gamblers. More specifically, probable pathological gamblers reported having more fathers/stepfathers having gambling and substance use problems than other adolescents, while at risk-and probable pathological gamblers reported approximately the same percentage of mothers/stepmothers having problems with gambling and substances. Consistent with the literature were findings that significantly more fathers/stepfathers were felt to have a gambling problem, as gambling is still largely a male phenomenon. In addition, the current results confirm past research which has found that individuals who have gambling-related

problems are more likely to have a parent with an addiction (Fisher, 1993; Griffiths, 1995; Gupta & Derevensky, 1998a; Wood & Griffiths, 1998). One of the limitations of these findings is that the parental problems were not confirmed through corroboration and is based merely on adolescent reports.

Drug and Alcohol Use

The finding that 15.8% of youth are involved in use of chemicals (i.e., drugs and alcohol) to a problematic degree is consistent with findings reported in the literature and remains worrisome. Past research suggests that approximately 6-10% percent of adolescents are estimated to meet the criteria for drug dependency (Wheeler & Malmquist, 1987); if alcohol is included in the criteria, then rates range from 9-28% (NRC, 1999). Not surprisingly, significantly more males and older adolescents were classified in the high risk category (substance use) compared to females and younger youth. Furthermore, risk for chemical dependency increases with gambling severity, such that a greater percentage of probable pathological gamblers are in the high risk category on the Problem Severity scale. With respect to mean scores on the Problem Severity scale of the PESQ, probable pathological gamblers had the highest mean scores indicating problematic involvement with all forms of substances. With respect to drug use and history of use, alcohol was found to be the most frequently used substance, along with marijuana, and hard drugs. As expected, probable pathological gamblers reported significantly more frequent alcohol use and marijuana use than other youth. Both probable pathological and at-risk gamblers used hard drugs on a regular basis more than non gamblers and social gamblers.

Past research has found links between gambling and other addictions; adolescent gamblers have been found to be significantly more likely to drink alcohol, smoke tobacco, and take drugs compared to non-gamblers (Griffiths & Sutherland, 1998; Potenza et al., 2000). However, this is one of the few adolescent gambling studies that have measured adolescent substance dependence using a standardized screen. It is clear that gambling and substance use are comorbid disorders. Common risk-factors for both drug abuse and problem gambling include low self-esteem, depression, suicidality, being a victim of abuse (physical or sexual), poor school performance, history of delinquency, poor impulse control, being male, early onset, parental history of respective problem, and community and family norms that promote accessibility to the respective activity (Dickson et al., in press-a; Dickson et al., in press-b; Hardoon & Derevensky, 2002; Stinchfield & Winters, 1998). Winters and Anderson (2000) have suggested that the association of these two behavioral patterns is not trivial given the overlap between the risk-factors. However, the nature of the relationship between drug abuse and gambling remains unclear. Additional research is needed to shed light on how these common factors lead to the co-existence between gambling and drug use in some youth and not in others and to what extent unique risk-factors can be identified.

Conduct Problems

A staggering percentage of probable pathological gamblers (70.8%) met the clinical criteria for conduct problems, with a large number of at-risk gamblers (45.7%) meeting this criteria as well. Mean scores on this scale were also found to be extremely high, with probable pathological (*M* =

66.40) and at-risk (M = 60.31) gamblers mean scores being significantly greater (1 standard deviation) than non gamblers and social gamblers. These individuals are likely to break rules, have more problems with persons in authority, are more likely to engage in antisocial activities than most individuals their age, are oppositional, and are also more likely to have engaged in serious misconduct (e.g., destruction of property, taking drugs).

ADHD, Impulsivity and Gambling Behavior

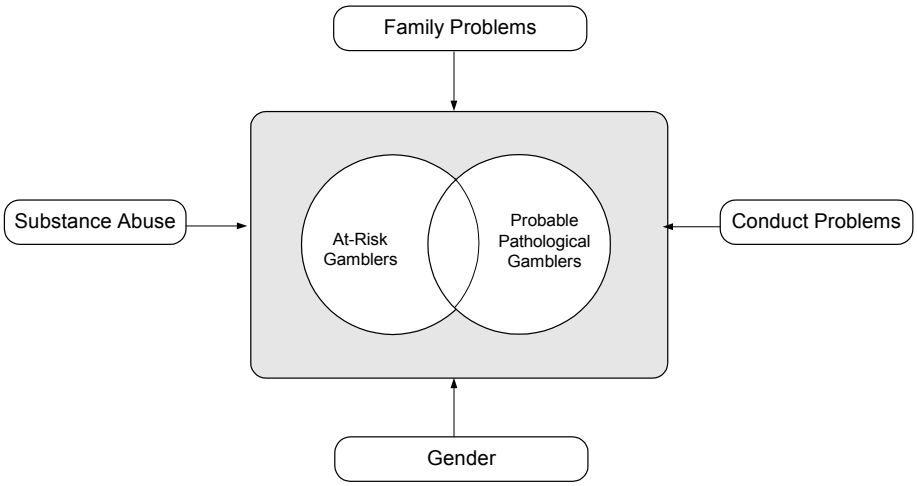
Results revealed that a significantly large number of adolescent probable pathological gamblers exhibit classic symptoms of ADHD. These findings are also consistent with research suggesting that pathological gamblers, or a subgroup of pathological gamblers, display elevated levels of impulsivity (Moran, 1970; Zimmerman et al., 1985). Research has indicated that subtle EEG deficits found in recovered pathological gamblers parallel those found in children with attention deficit disorder (ADD) (Carlton et al., 1987). Adolescent problem and pathological gamblers have also been found to score higher on the Excitability factor of the High School Personality Questionnaire, indicating similar traits to children with ADHD (e.g., distractibility, over activity, and impulsivity) (Gupta & Derevensky, in press). Thus, it appears as though ADHD, particularly the inattentive subtype, is related to adolescent problem gambling. While this study represents an interesting beginning, physiological research is needed to clarify the relationship between ADHD and gambling. With respect to risk reduction prevention efforts for problem gambling, special attention should be paid to children with ADHD.

A Model for Problem Gambling

The results suggest that probable pathological gamblers and to some extent at-risk gamblers are experiencing a host of problems, including academic difficulties, cognitive problems, chemical dependency, conduct problems, family problems, and ADHD and related subtypes. The results of the logistic regression analyses suggest that the path leading to addiction is similar for both probable pathological and at-risk gamblers and includes family problems, conduct problems, chemical dependency, and gender (male) as risk factors (see Figure 5). No other variables were found to be significant. It is interesting that no differences were found for at-risk and probable pathological gamblers. Perhaps, as previously argued (Gupta & Derevensky, 1998a, 1998b), at-risk gamblers are more like PPGs than otherwise thought.

While they may currently demonstrate fewer problems, the progression from at-risk to PPG may occur quickly. This finding has implications for the identification, prevention and treatment of gamblers. Perhaps, there is no longer value in differentiating between at-risk and probable pathological gamblers and subsequent classification should combine the two groups into one 'problem gambling' group. At this time, it is unlikely that all at-risk gamblers progress to more problematic gambling, some return to social and non problematic gambling. Longitudinal research is needed to examine these possibilities and the pathways leading to gambling severity. With respect to prevention and treatment, the knowledge that at-risk gamblers have the same risk factors as probable pathological gamblers indicates that prevention programs must focus on these individuals before their symptomatology becomes severe. The findings that family problems, conduct problems, and chemical dependency, as well as being male are predictors and risk

factors for the development of problematic gambling has implications for prevention and treatment. Family factors have often been linked with problem behaviors. Poor parental and family functioning has been consistently documented as a factor contributing to narcotic addiction and other serious deviance.



Note: Substance abuse includes drug and alcohol; Gender refers to males

Figure 5. A Conceptual Model for At-Risk and Problem Gambling.

The results have identified a multitude of problems experienced by problem gamblers. These risk factors for problem gambling include academic difficulties, poor perceived familial and peer social support, cognitive problems, emotional problems, substance use problems, conduct problems, family problems, parental involvement in gambling and substances, and ADHD and related symptoms, particularly inattention. The magnitude of problems and psychopathology that are reported by probable pathological gamblers and at-risk problem gamblers demonstrates that these individuals are experiencing many difficulties and are likely using their gambling as a means to escape their problems.

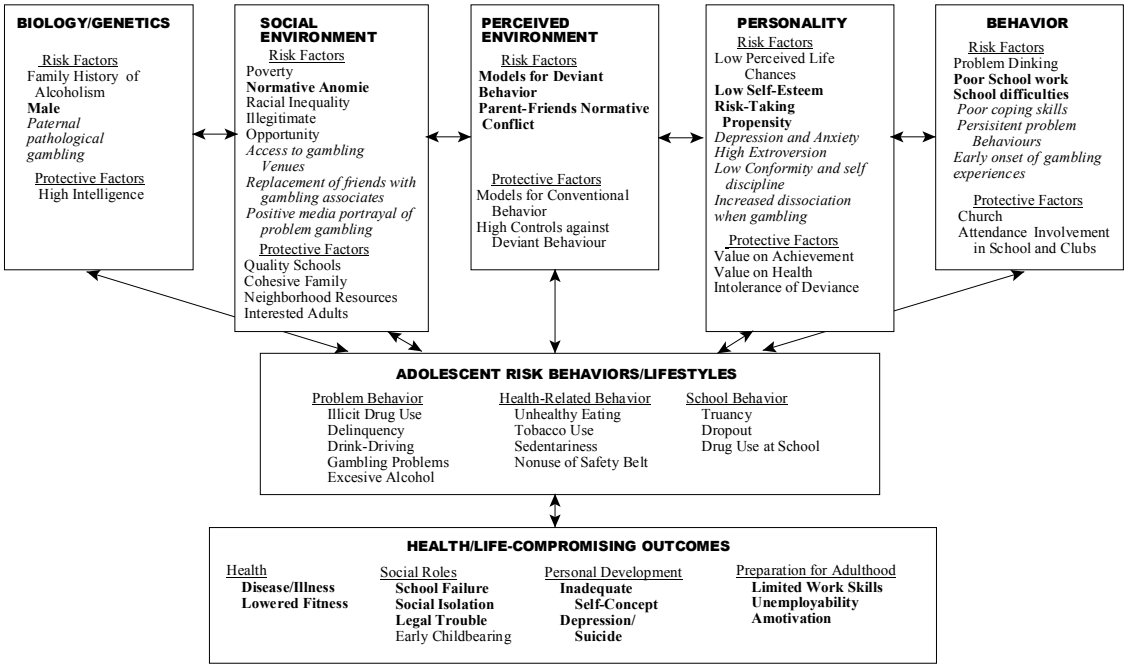
Moreover, the current study has enabled the identification of a set of predictor variables which lead to problem gambling. These include having family problems, conduct problems, being addicted to drugs or alcohol, and being male. When developing prevention programs and awareness campaigns, particular attention should be paid to these youth (males who are experiencing negative family climates, conduct problems, and difficulty with substance use). These individuals appear to be the most at-risk for the development of gambling problems. Further, as noted, the current study has tapped into some of the risk factors included in Jessor's (1998) model. However, further research is needed in order to empirically examine these risk and protective factors and their relationship to youth gambling.

These findings clearly suggest that prevention programs need to be developed which incorporate knowledge regarding risk factors. Prevention programs aimed at curtailing problem gambling will be most successful if conceptually driven from research on risk factors and resiliency (Dickson et al., in press-a). Such prevention programs (i.e., in the fields of alcohol and drug

abuse) have focused on the concepts of risk and protective factors and their interaction (Brounstein, Zweig, & Gardner, 1999) and seek to prevent or limit the effects of risk factors and increase protective factors.

Prevention efforts need to promote the development of resilience in youth (Dickson et al., in press-a). It is clear that several variables, in combination, influence whether adolescents engage in excessive gambling behavior. In addition, the compromising outcomes of adolescent problem gambling are similar in nature to other youth risky behaviors (e.g., physical, social, personal, etc.) thus necessitating the need for a multifaceted prevention approach.

Dickson et al. (in press-a) have adapted Jessor's (1998) original risk factor model to incorporate youth gambling risk factors. This model can be seen in Figure 6 and incorporates biological, social, environmental, personality, and behavioral risk and protective factors. Jessor's (1998) model provides a theoretical basis for mental health prevention programs that are based upon promoting resilience.



Bold: Shared risk factors *Italics: Factors specific to gambling*

Figure 6. Adolescent Risk Behavior Model.

Adolescent problem gambling has been included in this model based on empirical research and appears to have a number of unique risk factors (italics) and shared risk factors with other risky behaviors (bold). The remaining risk factors (standard font) are those that have either not been empirically validated or have not been found to be risk factors for problem gambling amongst

youth. However, they have been found to be precursors for other risky behaviors in youth (Dickson et al., in press-a). It should be noted that the current study has tapped into several of the variables included in the model. However, significantly more research is needed in order to examine the efficacy of the model (for gambling) from a quantitative perspective.

Limitations and Directions for Future Research

Although this study yielded interesting findings regarding risk factors which play a role in the development and maintenance of gambling behavior, it is not without limitations. The current study exclusively used self report data and no corroboration was ascertained. A study of this magnitude could not have been conducted using interview data and corroborative reports of parents and teachers. The study also focused a great deal on adolescents' perceptions. Perhaps future research can supplement self-report data with corroborative reports from parents, peers, and school records. There may have also been a sampling bias in the current study given that schools and participants self-selected to participate. Nonetheless, participants were representative of diverse geographic locations (both urban and rural setting) as well socioeconomic status.

Longitudinal research is the next step in the identification and confirmation of risk and protective factors contributing to the development of youth gambling problems. Such research can help us understand the course of the problem over time, to help us understand the process of self-recovery, and to help determine the true social costs associated with youth gambling problems.

The investigation of protective factors for youth gambling is greatly needed as there has been virtually no research in this area. The identification of protective factors will no doubt inform work on prevention and intervention models. Further research should also attempt to look more closely at the variables which factored into the model as well as investigate the Dickson et al (in press-a) model. Jacobs (2002) maintains that early life experiences may serve to predispose youth to develop the kinds of maladaptive emotional and behavioral reactions that lead to gambling-related problems (as well as other addictive behaviors). This theory, regarding early life experiences including neglect, abuse, and trauma, needs to be further examined in youth who develop gambling problems as there is a reported strong link between early childhood traumas and subsequent development of gambling problems.

Adolescence is an important developmental period for the onset of mental health problems and for the need to successfully adapt to many psychosocial changes. It is also a time of increased sensitivity and vulnerability, frequently associated with emotional and behavioral difficulties. As such, the finding that youth are experiencing a host of problems related to their gambling behavior suggests the need for the development of effective mental health and risk reduction prevention programs. Gambling awareness campaigns are also crucial, given the large numbers of underage youth who are reporting gambling and those with serious gambling problems. Additional research aimed at the identification of protective factors is necessary in order to develop appropriate school-based prevention programs. Gambling is one of the most frequently engaged in activities by youth, it is time to take a proactive stance in the reduction of youths' participation in these activities and to directly address the subsequent problems that they are experiencing.

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APPENDIX A: Questionnaire

All information is confidential and anonymous. We do not require any identifying information and only our research team at McGill University will have access to this information. Please do not indicate your name on this sheet.

For all of the following questions please fill in marks like this: ● not like this: ⊘ ⊗ ✓

Grade	7	8	9	10	11	12	OAC			Gender	Male	Female
	○	○	○	○	○	○	○				○	○
Age	11	12	13	14	15	16	17	18	19	20		
	○	○	○	○	○	○	○	○	○	○		

Instructions: For the items below, fill in the circle that indicates whether the item is **Not At All**, **Just a Little**, **Pretty Much**, or **Very Much True** for you. "Not at all" means that the item is *seldom or never* a problem. "Very Much" means that the item is *very often a problem* or occurs *very frequently*. "Just a Little" and "Pretty Much" are in between. Please respond to all the items.

0 = NOT TRUE AT ALL (Never, Seldom)
1 = JUST A LITTLE TRUE (Occasionally)
2 = PRETTY MUCH TRUE (Often, Quite a Bit)
3 = VERY MUCH TRUE (Very Often, Very Frequent)

1.	My parents' discipline is too harsh	⓪	①	②	③
2.	I feel like crying	⓪	①	②	③
3.	I bend the rules whenever I can	⓪	①	②	③
4.	I tend to learn more slowly than I would like to	⓪	①	②	③
5.	I am easily set off	⓪	①	②	③
6.	I cannot sit still for very long	⓪	①	②	③
7.	My parents only notice my bad behavior	⓪	①	②	③
8.	I make careless mistakes or have trouble paying close attention to details	⓪	①	②	③
9.	Punishment in our house is not fair	⓪	①	②	③
10.	I am discouraged	⓪	①	②	③
11.	I have trouble keeping my attention focused when playing or working	⓪	①	②	③
12.	I get into trouble with the police	⓪	①	②	③
13.	I have trouble organizing my schoolwork	⓪	①	②	③
14.	I tend to explode easily	⓪	①	②	③
15.	I have too much energy to sit still for long	⓪	①	②	③
16.	My parents do not reward or notice my good behavior	⓪	①	②	③
17.	I have trouble listening to what people say to me	⓪	①	②	③
18.	My parents are too strict	⓪	①	②	③
19.	I feel sad and gloomy	⓪	①	②	③
20.	I have trouble finishing my schoolwork or chores	⓪	①	②	③
21.	I break rules	⓪	①	②	③

0 = NOT TRUE AT ALL (Never, Seldom)
1 = JUST A LITTLE TRUE (Occasionally)
2 = PRETTY MUCH TRUE (Often, Quite a Bit)
3 = VERY MUCH TRUE (Very Often, Very Frequent)

22. I forget things that I have learned	⓪	①	②	③
23. I have a hot temper	⓪	①	②	③
24. I tend to squirm and fidget	⓪	①	②	③
25. My parents expect too much from me	⓪	①	②	③
26. I have problems organizing my tasks and activities	⓪	①	②	③
27. It seems like my parents are always criticizing me	⓪	①	②	③
28. I worry a lot about little things	⓪	①	②	③
29. I like to hurt some people	⓪	①	②	③
30. It takes a lot of effort to get my schoolwork done	⓪	①	②	③
31. I lose my temper	⓪	①	②	③
32. I feel restless inside even if I am sitting still	⓪	①	②	③
33. Noises tend to put me off track when I am studying	⓪	①	②	③
34. I don't like schoolwork or homework where I have to think a lot	⓪	①	②	③
35. There is a lot of yelling in our house	⓪	①	②	③
36. A lot of things scare me even if I would not admit it to others	⓪	①	②	③
37. I have urges to do really bad things	⓪	①	②	③
38. Sticking with things for more than a few minutes is difficult	⓪	①	②	③
39. My temper gets me into trouble	⓪	①	②	③
40. I have to get up and move around during homework	⓪	①	②	③
41. I do not have good judgment about a lot of things	⓪	①	②	③
42. I lose things necessary for tasks or activities (e.g. school assignments, pencils, books, or tools)	⓪	①	②	③
43. The rules in our house are not very clear	⓪	①	②	③
44. I act okay on the outside, but inside I am unsure of myself	⓪	①	②	③
45. I destroy property that belongs to others	⓪	①	②	③
46. I have trouble keeping my thoughts organized	⓪	①	②	③
47. A lot of things irritate me	⓪	①	②	③
48. I have trouble sitting still through a meal	⓪	①	②	③
49. I have trouble playing or doing leisure activities quietly	⓪	①	②	③
50. I am distracted when things are going on around me	⓪	①	②	③
51. My family does not do many fun things together	⓪	①	②	③
52. I am afraid to be alone	⓪	①	②	③
53. I am forgetful in my daily activities	⓪	①	②	③
54. I like to do dangerous things	⓪	①	②	③

0 = NOT TRUE AT ALL (Never, Seldom)
1 = JUST A LITTLE TRUE (Occasionally)
2 = PRETTY MUCH TRUE (Often, Quite a Bit)
3 = VERY MUCH TRUE (Very Often, Very Frequent)

55. I lose track of what I am supposed to do	⓪	①	②	③
56. People bug me and get me angry	⓪	①	②	③
57. I fidget (with my hands or feet) or squirm in my seat	⓪	①	②	③
58. I like to be on the go rather than being in one place	⓪	①	②	③
59. I am behind in my studies	⓪	①	②	③
60. I leave my seat when I am not supposed to (e.g. in school)	⓪	①	②	③
61. I am not very close to my family	⓪	①	②	③
62. I get nervous	⓪	①	②	③
63. I am restless or overactive	⓪	①	②	③
64. I am truant from school (i.e., stayed out of school without permission)	⓪	①	②	③
65. I have trouble concentrating on one thing at a time	⓪	①	②	③
66. I still throw tantrums	⓪	①	②	③
67. I am a lonely person	⓪	①	②	③
68. Sometimes I feel like I am driven by a motor	⓪	①	②	③
69. I am touchy or easily annoyed	⓪	①	②	③
70. I am always on the go	⓪	①	②	③
71. My parents do not really care about me	⓪	①	②	③
72. The future seems hopeless to me	⓪	①	②	③
73. I take things that do not belong to me	⓪	①	②	③
74. I am very disorganized when it comes to homework	⓪	①	②	③
75. I talk too much	⓪	①	②	③
76. I have a lot of aches and pains	⓪	①	②	③
77. I drink alcoholic beverages	⓪	①	②	③
78. I read slowly and with a lot of effort	⓪	①	②	③
79. I give answers to questions before the questions have been completed	⓪	①	②	③
80. I take drugs	⓪	①	②	③
81. I have trouble with reading and spelling	⓪	①	②	③
82. I have trouble waiting in line or taking turns with others	⓪	①	②	③
83. My handwriting is poor	⓪	①	②	③
84. I lose my place when I am reading	⓪	①	②	③
85. I am easily lead into trouble	⓪	①	②	③
86. I interrupt others when they are working or playing	⓪	①	②	③
87. I have nightmares	⓪	①	②	③

Directions: The statements which follow refer to gambling behavior. For each statement, please indicate the frequency with which the item has occurred: *Never, Once or Twice, Sometimes, Often*. Please note that gambling refers to betting **money** on activities (e.g., lottery, cards, sports wagers, bingo, vlt/slot machines, casino type games, sporting events, racetrack betting, games of skill, etc.) with a chance of winning money.

For all of the following questions please fill in marks like this: ● not like this: ⊘ ⊗ ✓

	Never	Once or Twice	Sometimes	Often
1) In the past year have you gambled for money?	○	○	○	○
2) In the past year how often have you found yourself thinking about gambling or planning to gamble?	○	○	○	○
3) During the course of the past year have you needed to gamble with more and more money to get the amount of excitement you want?	○	○	○	○
4) In the past year have you ever spent <u>much</u> more than you planned to on gambling?	○	○	○	○
5) In the past year have you felt bad or fed up when trying to cut down or stop gambling?	○	○	○	○
6) In the past year how often have you gambled to help you escape from problems or when you are feeling bad?	○	○	○	○
7) In the past year, after losing money gambling, have you returned another day to try and win back money you lost?	○	○	○	○
8) In the past year has your gambling ever led to lies to your family?	○	○	○	○
9) In the past year have you ever taken money from the following <u>without permission</u> to spend on gambling:				
a) School dinner money or fare money?	○	○	○	○
b) Money from your family?	○	○	○	○
c) Money from outside the family?	○	○	○	○
10) In the past year has your gambling ever led to arguments with family/friends or others?	○	○	○	○
11) In the past year has your gambling ever led to missing school*?*	○	○	○	○

Directions: The statements which follow refer to feelings and experiences which occur to most people at one time or another in their relationship with **friends**. For each statement, there are three possible answers: *Yes, No*, and *Don't Know*.

For all of the following questions please fill in marks like this: ● not like this: ⓘ ⓧ ✓

		Yes	No	Don't Know
1.	My friends give me the moral support I need	○	○	○
2.	Most people are closer to their friends than I am	○	○	○
3.	My friends enjoy hearing about what I think	○	○	○
4.	Certain friends come to me when they have problems or need advice	○	○	○
5.	I rely on my friends for emotional support	○	○	○
6.	If I felt that one or more of my friends were upset with me, I'd just keep it to myself	○	○	○
7.	I feel that I'm on the fringe in my circle of friends	○	○	○
8.	There is a friend I could go to if I were just feeling down, without feeling funny about it later	○	○	○
9.	My friends and I are very open about what we think about things	○	○	○
10.	My friends are sensitive to my personal needs	○	○	○
11.	My friends come to me for emotional support	○	○	○
12.	My friends are good at helping me solve problems	○	○	○
13.	I have a deep sharing relationship with a number of friends	○	○	○
14.	My friends get good ideas about how to do things or make things from me	○	○	○
15.	When I confide in friends, it makes me feel uncomfortable	○	○	○
16.	My friends seek me out for companionship	○	○	○
17.	I think that my friends feel that I'm good at helping them solve problems	○	○	○
18.	I don't have a relationship with a friend that is as intimate as other people's relationships with friends	○	○	○
19.	I've recently gotten a good idea about how to do something from a friend	○	○	○
20.	I wish my friends were much different	○	○	○

Directions: The statements which follow refer to feelings and experiences which occur to most people at one time or another in their relationship with **families**. For each statement, there are three possible answers: *Yes, No*, and *Don't Know*.

For all of the following questions please fill in marks like this: ● not like this: ⓘ ⓧ ✓

		Yes	No	Don't Know
1.	My family gives me the moral support that I need	○	○	○
2.	I get good ideas about how to do things or make things from my family	○	○	○
3.	Most people are closer to their family than I am	○	○	○
4.	When I confide in the members of my family who are closest to me, I get the idea that it makes them uncomfortable	○	○	○
5.	My family enjoys hearing about what I think	○	○	○
6.	Members of my family share many of my interests	○	○	○
7.	Certain members of my family come to me when they have problems or need advice	○	○	○
8.	I rely on my family for emotional support	○	○	○
9.	There is a member of my family I could go to if I were just feeling down, without feeling funny about it later	○	○	○
10.	My family and I are very open about what we think about things	○	○	○
11.	My family is sensitive to my personal needs	○	○	○
12.	Members of my family come to me for emotional support	○	○	○
13.	Members of my family are good at helping me solve problems	○	○	○
14.	I have a deep sharing relationship with a number of members of my family	○	○	○
15.	Members of my family get good ideas about how to do things or make things from me	○	○	○
16.	When I confide in members of my family, it makes me feel uncomfortable	○	○	○
17.	Members of my family seek me out for companionship	○	○	○
18.	I think that my family feels that I'm good at helping them solve problems	○	○	○
19.	I don't have a relationship with a member of my family that is as close as other people's relationships with their family members	○	○	○
20.	I wish my family were much different	○	○	○

Directions: The following questions ask about you and your experiences, including those with alcohol and other drugs. Some questions ask how often certain things have happened. Others ask if you agree with a statement. Please read each question carefully. Fill in the circle under the answer that is right for you. *Fill in only one response option for each question.* Please answer every question and fill in the appropriate bubbles.

How often have you used alcohol or other drugs:	**never**	**once or twice**	**sometimes**	**often**
1. At home	○	○	○	○
2. At places on the street where adults hang around	○	○	○	○
3. With older friends	○	○	○	○
4. At the homes of friends or relatives	○	○	○	○
5. At school activities, such as dances or football games	○	○	○	○
6. At work	○	○	○	○
7. When skipping school	○	○	○	○
8. To enjoy music or colors, or feel more creative	○	○	○	○
9. While driving a racing boat	○	○	○	○
How often have you:				
10. Made excuses to your parents about your alcohol or drug use	○	○	○	○
11. Gotten drugs from a dealer	○	○	○	○
12. Used alcohol or drugs secretly, so nobody would know you were using	○	○	○	○
13. Made excuses to teachers about your alcohol or drug use	○	○	○	○
14. Been upset about other people talking about your using drugs or drinking	○	○	○	○
15. Lost your sense of taste for several days after using Drugs	○	○	○	○
When using alcohol or other drugs, how often have you:				
16. Spilled things, bumped into things, fallen down, or had trouble walking around	○	○	○	○
17. Seen, felt, or heard things that were not really there	○	○	○	○
18. Spent money on things you wouldn't normally buy	○	○	○	○
19. Found out things you said or did while using or drinking that you did not remember	○	○	○	○
In order to get or pay for alcohol or other drugs, how often have you:				
20. Sold drugs	○	○	○	○
21. Bought drugs from a security guard	○	○	○	○

Please answer the following questions about your experiences:	**Yes**	**No**
22. I am always nice, even to people who are not nice	○	○
23. I worry a lot about little things for no reason	○	○
24. There have been times when I took advantage of someone	○	○
25. I am bothered by unusual thoughts	○	○
26. There have been times when I was mad at an adult even though I knew they were right	○	○
27. I feel sad, blue, or depressed much of the time	○	○
28. I often suffer from headaches or a nervous stomach	○	○
29. I am always willing to admit it when I make a mistake	○	○
30. I think about killing myself	○	○
31. There have been times when I felt like swearing or smashing things	○	○
32. There is something wrong with the way my mind works	○	○
33. Someone in my family hits me when they are angry	○	○
34. I am afraid of someone because they have been sexual with me	○	○

During the past 12 months, how many times (if any):

①=Never ②=1-2 times ③=3-5 times ④= 6-9 times ⑤=10-19 times ⑥ =20-39 times ⑦=40+ times

35. Have you had alcoholic beverages (including beer, wine, and liquor) to drink	① ② ③ ④ ⑤ ⑥ ⑦
36. Have you used marijuana (grass, pot) or hashish (hash, hash oil)	① ② ③ ④ ⑤ ⑥ ⑦
37. Have you used hard drugs other than alcohol or marijuana	① ② ③ ④ ⑤ ⑥ ⑦

38. If you have used other hard drugs, fill in the circle following each drug that you have used at least once during the last 12 months:

psychedelics (such as LSD, mescaline, peyote, PCP, mushrooms)	○
cocaine (coke, crack)	○
amphetamines (such as uppers, speed, bennies; not diet pills)	○
Quaaludes (such as quads, sopors, methaqualone)	○
Barbiturates (such as downs, goofballs, yellows, blues)	○
Tranquilizers (such as Librium, Valium)	○
Heroin (smack, horse, skag)	○
Other narcotics (such as methadone, opium, morphine, codeine, Demerol)	○
inhalants (such as glue, aerosol cans, gases, correction fluid)	○

	never	**grade 6 or before**	**grade 7-8**	**grade 9-10**	**grade 11 or after**
39. I first got high	○	○	○	○	○
40. I first used regularly	○	○	○	○	○

Directions: Please fill in the bubbles for following questions regarding gambling activities, family, social, and school life.

1) Please indicate the following types of ***gambling*** **(for money)** you have done in the past 12 months. Please darken only one answer/circle for each item.

1 = never **2 = less than once a week** **3 = once a week or more**

a)	play cards	①	②	③
b)	wager on sports (i.e. sports pools) with friends	①	②	③
c)	purchase sports lottery tickets (pro-line)	①	②	③
d)	purchase lottery tickets or scratch tickets	①	②	③
e)	wager on video games for money	①	②	③
f)	play VLT's (gambling machines found in bars)	①	②	③
g)	play bingo	①	②	③
h)	play slot machines	①	②	③
i)	wager on sports, pool, bowling, other games of skill	①	②	③
j)	racetrack betting	①	②	③
k)	casino type games	①	②	③
l)	internet gambling **(with money)**	①	②	③
m)	internet gambling **(without money)**	①	②	③
n)	another form of gambling not listed above	①	②	③

Please list _____

2) To your knowledge do any of these people have a gambling problem?
(you can have more than one answer)

- mother/stepmother ○
- father/stepfather ○
- sister ○
- brother ○
- other relative ○
- friend ○
- classmate ○
- other person in your life ○

Please list _____

3) To your knowledge do any of these people have a drinking/drug problem?
(you can have more than one answer)

- mother/stepmother ○
- father/stepfather ○
- sister ○
- brother ○
- other relative ○
- friend ○
- classmate ○
- other person in your life ○

Please list _____

4) Who currently lives at home with you?
(you can have more than one answer)

- mother ○
- father ○
- sister(s) ○
- brother(s) ○
- stepfather ○
- stepmother ○
- stepbrother ○
- stepsister(s) ○
- half sister(s) ○
- half brother (s) ○
- grandparent(s) ○

5) Do you have someone that you feel you can confide in and discuss your problems with? yes ○ no ○

If yes, please indicate the person(s) (you can have more than one answer)

- Friend ○
- Brother/sister ○
- Parent ○
- Other relatives ○
- Teacher ○
- Minister, Priest, Rabbi ○
- Counselor/psychologist ○
- Other ○ Please list _____

6) Do you belong to a:

- Community Centre ○
- Religious organization ○
- Cub Scouts/Girl Guides ○
- Sports team ○
- Other organized group ○ Please list _____

7) How many close friends do you have?

- none ○
- one ○
- two to three ○
- four to five ○
- six or more ○

8) How satisfied are you with your social life? (Number of friends and type activities in which you engage)

- Not happy ○
- Satisfied ○
- Very Pleased ○

9) Have you ever been diagnosed with a learning disability or learning problems? yes ○ no ○

10) What type of student would you describe yourself as:

- Fast learner ○
- Average learner ○
- Slow learner ○

11) Do you do well in school? yes ○ no ○

12) What is your overall average? _____

13) Have you ever sought professional help for an emotional, psychological, or learning problem? yes ○ no ○
If yes, what type of problem? _____

Thank-you for taking the time to fill this out!

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⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨		⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨
⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨		⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨
⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨											
⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨											

APPENDIX B: Additional Tables

Table B1: Regular[a] Involvement in Gambling Activities: Developmental Differences

Activities	Grade[1]						
	7	**8**	**9**	**10**	**11**	**12**	**13**
Cards***	3.1	5.3	6.6	9.7	6.6	8.9	6.8
Sports pool	2.3	3.8	6.9	4.9	4.1	5.9	5.5
Sports lottery***	1.1	1.8	4.5	4.0	3.6	4.3	6.4
Lottery***	3.1	2.5	5.4	3.5	3.2	5.1	9.6
Videogames	2.2	2.3	3.6	2.2	1.9	1.3	1.8
VLT machines	0.6	0.0	0.9	1.1	1.0	0.4	1.4
Bingo**	1.7	2.5	3.6	3.5	1.5	0.8	1.8
Slot machines	1.1	0.5	1.2	2.2	0.7	1.3	0.0
Games of skill**	2.5	3.3	6.6	4.3	4.4	5.9	3.2
Racetrack***	0.3	0.0	2.4	1.6	0.0	0.0	0.5
Casino games	0.0	1.5	0.9	1.4	1.2	2.1	0.0
Internet gambling ($)	0.0	0.8	0.0	1.6	0.5	0.9	0.0
Internet gambling (no $)*	5.6	7.6	8.7	7.3	5.6	3.4	3.7

[1]Percentage

[a]Refers to gambling once a week or more

*p<.05. **p<01.***p<001.

Table B2: Tamahane's T2 Post Hoc Tests: Gambling Group Differences on Social, Emotional, and Behavioral Problems Subscales of the CASS:L

CASS:L Subscales	Gambling Group Comparisons	Mean Difference	*P*
Family Problems			
	Non vs. Social	-1.30	.009
	Non vs. At-risk	-5.33	<.001
	Non vs. PPG	-9.80	<.001
	Social vs. At-risk	-4.03	<.001
	Social vs. PPG	-8.50	<.001
	At-risk vs. PPG	-4.46	.002
Emotional Problems			
	Non vs. At-risk	-4.00	<.001
	Non vs. PPG	-6.56	<.001
	Social vs. At-risk	-3.03	<.001
	Social vs. PPG	-5.59	<.001
Conduct Problems			
	Non vs. Social	-3.73	<.001
	Non vs. At-risk	-10.19	<.001
	Non vs. PPG	-16.28	<.001
	Social vs. At-risk	-6.45	<.001
	Social vs. PPG	-12.54	<.001
	At-risk vs. PPG	-6.09	<.001
Cognitive Problems			
	Non vs. At-risk	-4.45	<.001
	Non vs. PPG	-7.16	<.001
	Social vs. At-risk	-3.44	<.001
	Social vs. PPG	-6.44	<.001
Anger Control Problems			
	Non vs. Social	-1.31	.004
	Non vs. At-risk	-4.84	<.001
	Non vs. PPG	-7.25	<.001
	Social vs. At-risk	-3.53	<.001
	Social vs. PPG	-5.93	<.001

Note: only significant differences are presented.

Table B3: Tamahane's T2 Post Hoc Tests: Gambling Group Differences on ADHD and Related Subscales of the CASS:L

CASS:L Subscales	Gambling Group Comparisons	Mean Difference	*P*
Hyperactivity			
	Non vs. Social	-1.77	<.001
	Non vs. At-risk	-4.06	<.001
	Non vs. PPG	-6.53	<.001
	Social vs. At-risk	-2.29	.011
	Social vs. PPG	-4.76	<.001
ADHD Index			
	Non vs. Social	-1.21	.026
	Non vs. At-risk	-5.53	<.001
	Non vs. PPG	-9.75	<.001
	Social vs. At-risk	-4.32	<.001
	Social vs. PPG	-8.54	<.001
	At-risk vs. PPG	-4.22	.005
DSM-IV: Inattention			
	Non vs. Social	-2.03	<.001
	Non vs. At-risk	-6.22	<.001
	Non vs. PPG	-10.02	<.001
	Social vs. At-risk	-4.19	<.001
	Social vs. PPG	-7.99	<.001
	At-risk vs. PPG	-3.80	.023
DSM-IV: Hyperactive Impulsive			
	Non vs. Social	-2.95	<.001
	Non vs. At-risk	-7.57	<.001
	Non vs. PPG	-10.84	<.001
	Social vs. At-risk	-4.63	<.001
	Social vs. PPG	-7.90	<.001
DSM-IV: Total			
	Non vs. Social	-2.87	<.001
	Non vs. At-risk	-7.94	<.001
	Non vs. PPG	-12.18	<.001
	Social vs. At-risk	-5.07	<.001
	Social vs. PPG	-9.31	<.001
	At-risk vs. PPG	-4.24	.012

Note: only significant differences are presented.

Table B4: Social, Emotional, and Behavioral Problems as Assessed by the CASS:L: Developmental Differences

Grade	Gambling Groups			
	Non gambler	Social gambler[a]	At risk gambler[b]	Probable pathological gambler[c]
Family problems	*M*	*M*	*M*	*M*
7	48.53	51.30	56.12	61.80
8	49.05	51.50	56.51	64.45
9	52.18	52.65	59.96	61.25
10	51.96	51.24	53.83	58.47
11	50.34	50.89	54.00	59.35
12	50.96	51.21	54.60	54.54
13	48.82	51.50	53.73	58.06
Emotional Problems				
7	50.54	51.78	57.81	57.30
8	50.47	51.79	57.23	60.65
9	49.66	51.03	56.96	57.06
10	51.61	50.72	52.59	53.94
11	51.30	52.03	52.03	59.43
12	52.16	53.36	54.05	54.00
13	51.79	52.95	55.27	57.12
Conduct Problems				
7	47.69	52.30	57.69	73.10
8	49.42	53.67	59.23	65.75
9	51.34	56.11	64.19	71.37
10	52.71	53.79	61.38	65.18
11	50.43	54.12	59.53	64.83
12	52.28	53.39	57.85	64.82
13	48.71	53.11	61.50	62.69
Cognitive Problems				
7	49.17	50.87	51.06	61.10
8	49.61	50.30	55.60	56.55
9	49.69	50.81	57.58	58.56
10	52.73	49.91	55.03	55.82
11	50.14	51.76	52.63	59.69
12	50.54	51.88	53.90	53.91
13	50.94	51.20	53.45	55.50
Anger Control Problems				
7	48.10	51.26	54.00	65.10
8	48.70	50.42	55.28	57.25
9	48.39	49.52	54.65	53.94
10	48.93	48.26	50.79	53.29
11	46.37	48.22	50.42	55.22
12	45.96	46.93	49.80	51.73
13	44.92	48.45	53.14	50.37

[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (4≥).

Table B5: ADHD and Subtypes as Assessed by the CASS:L: Developmental Differences

Grade	Gambling Groups			
	Non gambler	**Social gambler[a]**	**At risk gambler[b]**	**Probable pathological gambler[c]**
Hyperactivity	*M*	*M*	*M*	*M*
7	47.11	49.69	52.44	59.50
8	47.49	48.78	54.94	54.30
9	47.83	50.14	53.31	54.94
10	48.30	47.85	52.10	53.23
11	46.31	48.93	49.50	52.04
12	46.75	49.22	45.45	50.54
13	45.61	48.36	49.27	53.31
ADHD Index				
7	48.60	50.83	52.25	63.30
8	49.25	50.64	57.23	59.40
9	49.64	51.32	59.27	58.87
10	51.61	49.31	53.48	57.00
11	48.31	50.56	52.45	60.83
12	50.30	51.21	55.05	55.73
13	48.88	50.74	54.04	58.62
DSM-IV: Inattentive				
7	47.41	49.88	52.44	65.20
8	47.68	50.44	55.43	57.60
9	49.24	51.04	56.88	59.94
10	52.03	51.67	58.93	56.53
11	43.44	52.20	53.55	63.48
12	50.61	51.91	53.35	53.45
13	50.35	50.76	55.91	57.12
DSM-IV: Hyperactive Impulsive				
7	45.96	51.10	54.00	62.60
8	47.20	49.58	56.51	56.00
9	48.39	51.03	57.31	59.87
10	50.20	49.99	56.00	58.76
11	47.22	50.81	54.26	59.22
12	46.81	50.05	50.30	54.36
13	46.02	50.07	54.77	57.56
DSM-IV: Total				
7	46.22	50.50	53.75	65.70
8	47.08	50.08	56.83	57.80
9	48.67	51.27	58.23	61.50
10	51.33	50.87	58.48	59.23
11	47.92	51.69	54.34	63.26
12	48.42	51.09	52.10	54.64
13	47.75	50.45	56.32	58.81

[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (4≥).

Table B6: Drug/Alcohol Use: Gender Differences

Frequency	Drug use[1]					
	Alcohol		Marijuana		Hard drugs	
	Male	Female	Male	Female	Male	Female
Never	28.9	30.8	71.6	75.8	89.3	91.4
1-2 times	21.5	21.3	8.4	8.7	4.4	4.1
3-5 times	13.1	13.8	2.4	4.5	2.3	1.5
6-9 times	9.3	11.0	3.1	3.1	1.5	0.9
10-19 times	10.7	11.3	3.3	2.6	0.7	0.7
20-39 times	7.9	7.2	3.1	2.0	0.6	0.4
40+ times	8.6	4.6	8.2	3.3	1.2	1.0

[1]Percentage

Table B7: Drug/Alcohol Use: Developmental Differences

Grade Levels	Frequency[1]						
Alcohol Use	**Never**	**1-2**	**3-5**	**6-9**	**10-19**	**20-39**	**40+**
7	55.3	25.3	9.0	5.1	2.5	1.1	1.7
8	38.7	28.9	14.1	7.3	5.8	3.5	1.8
9	26.9	24.2	16.4	12.5	9.0	8.7	2.4
10	26.8	20.8	12.2	10.8	15.4	7.6	6.5
11	19.6	18.9	12.6	12.6	15.7	6.7	11.9
12	16.4	12.6	17.6	12.2	17.6	12.2	11.3
13	17.3	12.3	14.1	12.7	15.5	15.9	12.3
Marijuana Use							
7	98.3	0.6	0.0	0.6	0.0	0.3	0.3
8	87.9	6.0	2.5	1.5	0.8	0.5	0.8
9	76.1	9.3	2.7	3.9	2.1	1.8	4.2
10	68.9	9.2	3.0	4.3	3.2	3.2	8.1
11	60.0	10.7	4.8	5.8	6.3	3.4	9.0
12	57.6	12.6	7.1	2.1	5.0	6.7	8.8
13	57.5	16.0	7.3	2.7	4.6	3.2	8.7
Hard Drug Use							
7	98.9	0.3	0.6	0.3	0.0	0.0	0.0
8	94.5	2.8	2.0	0.5	0.3	0.0	0.0
9	92.5	3.3	1.5	0.9	0.6	0.0	1.2
10	87.8	5.1	1.9	2.2	0.5	0.8	1.6
11	88.4	4.1	1.5	1.5	1.2	1.5	1.9
12	84.8	7.6	2.5	1.7	0.4	0.4	2.5
13	81.4	10.0	3.6	1.4	2.3	0.5	0.9

[1]Percentage

Table B8: Alcohol Use[d] by Gambling Severity and Gender

Gambling Levels	Alcohol Use[1]						
	Never	**1-2**	**3-5**	**6-9**	**10-19**	**20-39**	**40+**
Non gambler							
Male	52.7	19.4	12.2	5.9	4.5	2.7	2.7
Female	45.1	23.0	11.4	8.1	7.2	2.8	2.4
Social gambler[a]							
Male	25.3	24.5	13.8	11.1	12.4	6.4	6.5
Female	22.0	21.1	15.6	12.9	13.9	9.6	4.9
At-risk gambler[b]							
Male	14.8	19.1	14.8	7.0	10.4	13.9	20.0
Female	14.1	15.6	14.1	12.5	17.2	14.1	12.5
Probable pathological gambler[c]							
Male	9.0	11.2	9.0	10.1	16.9	22.5	21.3
Female	9.1	4.5	4.5	13.6	18.2	22.7	27.3

[1]Percentage
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (4+).
[d] within the past 12 months

Table B9: Marijuana Use[d] by Gambling Severity and Gender

Gambling Levels	Marijuana Use[1]						
	Never	**1-2**	**3-5**	**6-9**	**10-19**	**20-39**	**40+**
Non gambler							
Male	86.5	4.5	0.5	1.4	1.4	2.7	3.2
Female	85.1	5.9	2.6	1.8	0.9	1.3	2.4
Social gambler[a]							
Male	72.5	8.6	3.1	2.9	3.3	2.6	7.1
Female	71.3	10.4	5.2	4.1	3.8	2.6	2.6
At-risk gambler[b]							
Male	54.8	12.2	2.6	6.1	4.3	5.2	14.8
Female	59.4	10.9	9.4	1.6	6.3	1.6	10.9
Probable pathological gambler[c]							
Male	50.6	12.4	2.2	4.5	6.7	4.5	19.1
Female	36.4	13.6	13.6	9.1	0.0	4.5	22.7

[1]Percentage
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (4≥).
[d] within the past 12 months

Table B10: Hard Drug Use[d] by Gambling Severity and Gender

Gambling Levels	Hard Drug Use[1]						
	Never	**1-2**	**3-5**	**6-9**	**10-19**	**20-39**	**40+**
Non gambler							
Male	96.8	0.5	0.9	0.9	0.5	0.0	0.5
Female	95.4	1.8	0.9	0.6	0.0	0.4	0.9
Social gambler[a]							
Male	90.3	4.4	1.8	1.8	0.7	0.0	0.9
Female	90.7	5.4	1.7	0.6	1.0	0.3	0.3
At-risk gambler[b]							
Male	81.7	7.8	2.6	0.9	0.9	26.0	3.5
Female	78.1	9.4	0.0	3.1	3.1	0.0	6.3
Probable pathological gambler[c]							
Male	73.0	10.1	7.9	2.2	1.1	3.4	2.2
Female	54.5	4.5	13.6	13.6	0.0	4.5	9.1

[1]Percentage
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (4≥).
[d] within the past 12 months

Table B11: Psychosocial Indicators by Gambling Severity and Gender

	Gambling Groups[1]							
	Non gambler		Social gambler[a]		At-risk gambler[b]		Probable pathological gambler[c]	
	M[d]	F[e]	M[d]	F[e]	M[d]	F[e]	M[d]	F[e]
Psychological Distress								
I worry a lot about little things or for no reason	49.1	64.9***	49.1	68.7***	53.0	75.0***	56.2	63.6
I feel sad, blue or depressed much of the time	16.7	26.5**	18.9	29.0***	26.3	45.3**	37.1	59.1
I often suffer from headaches or a nervous stomach	22.1	38.7***	28.9	46.3***	32.5	54.7**	44.9	86.4***
I think about killing myself	10.9	15.8*	15.0	20.3**	24.6	45.2**	29.9	54.5*
Thought Problems								
I am bothered by unusual thoughts	38.2	40.6	43.3	41.2	48.2	57.8	50.6	68.2
There is something wrong with the way my mind works	18.0	14.1	24.8	20.7	36.8	41.3	40.9	72.7**
Abuse								
Someone in my family hits me when they are angry	12.6	11.3	11.5	14.0	25.7	34.4	23.6	45.5*
I am afraid of someone because they have been sexual with me	4.5	5.5	3.3	6.7**	5.3	20.3**	8.0	42.9***

[1]Percentage
[a]DSM-IV-MR-J score (0-1). [b]DSM-IV-MR-J score (2-3). [c]DSM-IV-MR-J score (4≥).
[d]Male. [e]Female.
*p<.05. **p<.01. ***p<.001.

Table B12: Logistic Regression: Model Selection (Enter Method, No Weights)

Variable	B	S.E.	Wald	*df*	*p*	Exp(B)
Family Problems*	0.69	.020	12.290	1	.000	1.072
Emotional Problems	-.009	.017	.297	1	.586	.991
Conduct Problems*	.061	.019	10.267	1	.001	1.063
Anger Control Problems*	-.037	.020	3.528	1	.060	.963
Hyperactivity	.013	.022	.378	1	.539	1.014
DSM-IV: Inattentive	.015	.018	.753	1	.385	1.015
PSS Friend	.012	.036	.116	1	.733	1.012
PSS Family	.035	.033	1.128	1	.288	1.035
Problem Severity*	.031	.015	4.46	1	.035	1.031
Grade	-	-	7.919	6	-	-
Gender*	2.484	.414	36.044	1	.000	11.987

Note: B = Parameters, Exp(B) = odds ratio. *variables to be retained.

Table B13: Logistic Regression: Final Model (No Weights)

Variable	B	S.E.	Wald	*df*	*p*	Exp(B)
Family Problems	.052	.015	12.527	1	.000	1.054
Conduct Problems	.043	.015	7.799	1	.005	1.043
Problem Severity	.044	.013	12.274	1	.000	1.045
Gender	2.412	.390	38.319	1	.000	11.157

Table B14: Logistic Regression: Final Model (Weight 2)

Variable	B	S.E.	Wald	*df*	*p*	Exp(B)
Family Problems	.066	.022	9.275	1	.002	1.069
Conduct Problems	.075	.021	12.342	1	.000	1.078
Problem Severity	.053	.018	9.019	1	.003	1.054
Gender	3.087	.488	40.006	1	.000	21.917

Table B15: Logistic Regression: Model 1, At-Risk/Probable Pathological Group (Enter Method, Weight 2)

Variable	B	S.E.	Wald	*df*	*p*	Exp(B)
Family Problems*	.038	.015	6.925	1	.008	1.039
Emotional Problems	.008	.013	.392	1	.531	1.008
Conduct Problems*	.066	.013	25.117	1	.000	1.068
Anger Control Problems	-.010	.014	.555	1	.456	.990
Hyperactivity	-.010	.015	.441	1	.506	.990
DSM-IV: Inattentive	.011	.012	.827	1	.363	1.011
PSS Friend	-.002	.023	.010	1	.919	.998
PSS Family	.019	.021	.822	1	.365	1.020
Problem Severity*	.038	.012	10.305	1	.001	1.039
Grade			5.647	6	.464	
Gender*	1.728	.211	66.897	1	.000	5.631

Note: B = Parameters, Exp(B) = odds ratio. *variables to be retained.

Table B16: Logistic Regression: Model 1, At-Risk/Probable Pathological Group (Backward Stepwise)

Variable	B	S.E.	Wald	*df*	*p*	Exp(B)
Family Problems	.035	.011	10.159	1	<.001	1.035
Conduct Problems	.062	.011	29.873	1	<.001	1.064
Problem Severity	.042	.011	14.958	1	<.001	1.043
Gender	1.729	.200	75.101	1	<.001	5.637