Risk and Protective Factors Associated with Use of Alcohol, Tobacco and Other Drugs and Gambling Participation

The Alberta Youth Experience Survey 2002

AADAC

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report focuses on risk and protective factors associated with the use of substances and gambling. It will uncover the similarities and differences in leading risk and protective factors associated with substance use and gambling participation.

In the 1990s, researchers began to use the risk and protective factors framework (Hawkins, Catalano, and Miller, 1992; Newcomb and Felix-Ortiz, 1992). The premise of the framework is that both risk and protective factors occur within life domains (individual, family, school, peer, and community) and that certain factors are related to substance use, substance misuse, or gambling behaviour. Examples of risk factors include parental support or peer risk behaviour. Parental support refers to youth's perception of the nature and closeness of their relationship to either parent. Peer risk behaviour reflects smoking cigarettes, drinking alcohol, etc., by youth. Protective factors include parental monitoring and social skills. Parental monitoring indicates that parents know where their adolescent is after school, who they go out with at night, and where they are at night and that parents set curfews on weekend nights. Social skills refer to an adolescent's ability to handle difficult situations such as being able to say no to friends.

The research on protective factors is more recent than, but not as conclusive as, the research on risk factors (AADAC, 2004b). Factors close to the individual tend to be more influential than distant factors. Peer factors are considered close factors, and community factors are considered distant (Center for Substance Abuse & Prevention [CSAP], 2001).

The effect of risk and protective factors is cumulative. As the number of risk factors increases, substance use or gambling participation increases. As the number of protective factors increases, substance use or gambling participation decreases. Risk and protective factors are in all life domains (individual, family, school, peer, and community), and the factors often interact with each other.

Key Finding from the Alberta Youth Experience Survey 2002

Across social domains, there are common and specific factors associated with alcohol, tobacco and other drug use or gambling participation. The predictive power of these factors varies, with alcohol and cannabis use most strongly predicted.

The most important risk factor common to all substances and to gambling participation is peer risk behaviour. The most important protective factor common to all substances and to gambling participation is parental monitoring. Each substance and gambling behaviour is also identified by unique risk and protective factors. For example, age is one of the most highly correlated risk factors for alcohol use; it is not for tobacco use (refer to Tables 3 and 4 in the appendix). These results support the need for both targeted and broad-based programs.

For both alcohol and cannabis use, the most important risk factors are peer risk behaviours, parental approval of licit and illicit substance use and signs of leaving school early. Parental approval refers to whether or not parents approve of their adolescent smoking tobacco, drinking alcohol or using drugs. Signs of leaving school early include adolescents that report they missed a whole day of school because they "cut" class or for some other reason. For alcohol use, age and family discord are the most important. Family discord refers to youth's perception of how well they think their parents get along. For cannabis use, father and mother support are most important. Parental support refers to youth's perception of the nature and closeness of their relationship to either parent.

The most important protective factors common to alcohol and cannabis use include social skills, parental monitoring, school marks (GPA or grade point average), and participation in pro-social activities. Examples of pro-social activities include church groups or after-hours school sports. The most important protective factor associated with alcohol use is peer influence in decision-making.

Peer influence refers to situations where friends push each other to succeed or when close friends' opinions are taken into account when making decisions. The most important protective factor associated with cannabis use is the number of positive adults in the neighbourhood (refer to Table 13 and Table 15 in the appendix). Positive adults are defined as individuals who encourage the youth in their communities to do their best, notice when youth are doing a good job and tell them that they are proud of them.

The risk and protective factor framework is more informative when predicting alcohol or cannabis use than it is when predicting tobacco use, club drug use or gambling participation. The predictive power of both risk and protective factors is higher for alcohol or cannabis use. The influence of both risk and protection is important to consider in substance use and gambling treatment and prevention programs. However, there are apparent limitations to the framework that can be examined with further analysis of existing data and new research.

INTRODUCTION

The Alberta Youth Experience Survey 2002 (TAYES) sought to answer questions about the proportion of Alberta youth who used alcohol, tobacco, or other drugs or gambled and the proportion of Alberta youth who used substances or participated in gambling in a harmful way. The survey also sought to investigate the factors that increased adolescents' protection from harmful substances, or increased their risk of substance use or abuse or gambling.

Three reports have been prepared based on TAYES: the *Summary Report*, the *Technical Report*, and the *Overview of Risk and Protective Factors*. This report is one of a series of special topical reports that are intended to provide greater detail on TAYES results and relevant literature than is contained in the Summary Report (Alberta Alcohol and Drug Abuse Commission [AADAC], 2003a). Topical reports are intended for use by professional educators and addictions workers.

One purpose of TAYES was to determine the current extent of use of alcohol, tobacco, and other drugs, and gambling behaviour (ATODG) among young Albertans. A critical second purpose of the survey was to focus attention on what, if anything, could be done to prevent certain problems or trends from developing or to intervene when they appeared.

The purpose of this report is to examine risk and protective factors associated with the use of alcohol, tobacco, cannabis, and club drugs (ecstasy and crystal meth) and gambling participation (playing cards for money, betting on sporting events with a friend, scratch tabs and VLT play).

Harmful use or abuse of these substances or gambling dependence is not examined in this paper. Refer to *The Alberta Youth Experience Survey 2002: Summary Report* (Alberta Alcohol and Drug Abuse Commission [AADAC], 2003a) for this information. Understanding which risk and protective factors are prominent can help addictions workers to make effective program decisions. This paper will uncover the similarities and differences in leading risk and protective factors associated with substance use and gambling participation.

The following questions are addressed:

• What risk factors are correlated with use of alcohol, tobacco, cannabis and club drugs and gambling participation (playing cards for money, betting on sporting events with a friend, scratch tabs and VLT play)?

• What protective factors are correlated with use of alcohol, tobacco, cannabis and club drugs and gambling participation (playing cards for money, betting on sporting events with a friend, scratch tabs and VLT play)?

• What risk factors are most strongly correlated with use of alcohol, tobacco, cannabis and club drugs and gambling participation (playing cards for money, betting on sporting events with a friend, scratch tabs and VLT play)?

• What protective factors are most strongly correlated with use of alcohol, tobacco, cannabis and club drugs and gambling participation (playing cards for money, betting on sporting events with a friend, scratch tabs and VLT play)?

LITERATURE REVIEW

Thousands of studies of adolescent alcohol, tobacco, and other drug use have been done around the world, and there is an increasing number of studies of adolescent gambling. For alcohol, tobacco, and other drugs, a number of key patterns of use and abuse have emerged and several risk and protective factors have been associated with use, misuse, and abuse of these substances. Adolescent gambling behaviour is less thoroughly researched, but seems to be similar with respect to major patterns.

Not every teen who gambles or uses alcohol or drugs has a problem. Most are involved in experimental use or social use that continues or stops before any problems or dependence develops. Others are harmfully involved or addicted. Addictions literature describes a continuum of involvement: roughly, use is at one end of the continuum, abuse at the other end, and misuse in the middle. The focus of this report is on the use of alcohol, tobacco, cannabis, club drugs (ecstasy and crystal meth), and participation in gambling (cards, sports, VLT and scratch tabs).

The risk and protective factors framework emerged in the 1990s as a new and effective way for researchers and practitioners to organize research on a multitude of factors related to ATODG. The framework is closely associated with the work of Hawkins et al. (1992) and Newcomb and Felix-Ortiz (1992). These researchers have organized over thirty years of detailed research findings in substance use and abuse and use the framework as an important way to make sense of the large number of complex interactions that affect the development of problems. Research examining risk and protective factors is critical for the development of treatment and prevention programs. TAYES was designed using this framework as a guiding and organizing principle.

Certain factors can be associated with use or abuse of alcohol, tobacco, other drugs, and gambling. The literature points to more than 250 risk factors and 150 protective factors. These factors usually appear within a particular domain or sphere of influence: individual, peer, family, school, or community. Factors that are closest to the individual are referred to as proximal factors. Typically these are family or peer factors. Other factors are considered distant (distal factors) and include community or societal-level factors. The report, *An Overview of Risk and Protective Factors* (George, Dyer, & Levin, 2003), and the paper, *Youth Trends and Risk and Protective Factors* (George, Munro, & Huebert, 2002), provide a summary of the major findings of related studies throughout Canada and the United States. There is more literature on risk factors than protective factors and this is reflected in the number of risk versus protective factors chosen in TAYES. The vast majority of literature also examines patterns of use, not abuse, when compared to risk and protective factors.

Risk factors are defined as either life events or experiences that are statistically associated with an increase in problematic behaviour such as alcohol and other drug use or abuse and problem gambling (Hawkins et al., 1992). Longitudinal studies have identified risk factors for substance abuse within individuals, in the environments within which they develop (including families, schools, peer groups and the broader community), and in the interactions of individuals and their environments.

Protective factors are defined as life events or experiences that mediate or moderate the effect of exposure to risk factors. The result is the reduced incidence of the problem behaviour (Garmezy, 1985; Rutter, 1979, as cited in Pollard and Hawkins, 1999).

Those factors closest to the individual (proximal factors) exert more influence than more distant ones (distal factors); for example, peer influences can be stronger than parental influences. However, close factors are influenced by more distant factors; for example, when young people enter their teens, parents can have a strong influence over the choice of peers (Center for Substance Abuse & Prevention [CSAP], 2001). Factors from

one domain often interact with factors from other domains. Risk and protective factors are found in all domains.

Research indicates that younger children tend to have more protective orientations or attitudes, greater commitment to school, and stronger perceptions of self-efficacy and self-control. However, between the ages of 11 and 16, these orientations shift toward greater risk, indicating a reduction in the internal protective orientations during junior and senior high (Substance Abuse and Mental Health Services Administration [SAMHSA], 2002).

METHODOLOGY

This report is based on secondary analysis of data collected for TAYES, 2002. Methods for the survey are reported in detail in the *Technical Report* (AADAC, 2003).

The Alberta Youth Experience Survey questionnaire comprised 84 questions. One questionnaire was used for all six grades (7 through 12). The questionnaire was based on comparable studies conducted in other provinces and states. The study's dependent measures are alcohol, tobacco, other drugs, and gambling use and abuse. The independent and co-varying measures in this study are risk and protective factors. Most of the independent and co-varying measures included in the study are described in a risk and protective factors framework associated with the work of Hawkins et al. (1992) and Newcomb and Felix-Ortiz (1992). Nineteen risk and eight protective factors, associated with both use and abuse, were selected from across the five domains or life dimensions in TAYES.

Causality has not yet been established for many risk and protective factors. Some may be markers and some may be true causes. All factors included in this study have been identified as important correlates because the research literature demonstrates relationships between these factors and substance abuse.

Two sets of criteria were established to guide selection of risk and protective factors. First, selected indicators with a strong track record in forecasting future substance use and abuse were identified from the Ontario Student Drug Use Survey (OSDUS) (Adlaf and Paglia, 2001) and the Monitoring the Future (MTF) survey (Johnston, O'Malley, and Bachman, 2001) and mapped to the risk and protective factors domains (individual, family, school, peer, and community). Second, a recent

AADAC review of risk and protective factors identified the key factors within each domain (George et al., 2002).

A balance was sought between covering the most important factors identified and using the briefest set of survey items available to measure those factors from existing questionnaires. Items were selected from the Ontario Student Drug Use Survey [OSDUS] (Adlaf and Paglia, 2001), MTF (Johnston et al., 2001), Texas Commission Alcohol and Drug Abuse (TCADA) (Texas Commission on Alcohol and Drug Abuse, 2000), National Longitudinal Survey on Children and Youth (NLSCY) (Human Resources and Development Canada, 2000), and Communities That Care surveys (Channing Bete Company, 2001). Where several measures were available, preference was given to those judged most easily read by youths, those used in Canadian studies, and those with better predictive power. The final set of questionnaire items was modified for readability prior to pre-testing.

Several pre-existing scales and newly created scales were used to measure the dependent and independent variables. Please refer to *Risk and Protective Factors Associated with Grade (Grades 7 to 12): The Alberta Youth Experience Survey 2002* (AADAC, 2004b) and review *The Alberta Youth Experience Survey, 2002: Technical Report* (AADAC, 2003b) for details when new scales were created and when individual questions were used.

Several pre-existing scales and newly created scales were used to measure the dependent and independent variables.

Table 1 contains a list of the 19 risk factors and Table 2 contains a list of the eight protective factors by domain.

Table 1

Domain	Risk Factors

Individual	• Age
	• Grade at first start:
	      - alcohol
	      - tobacco
	      - cannabis
	      - gambling
	• Ease of access to:
	      - alcohol
	      - cigarettes
	      - cannabis

Peer	• Peer risk behaviour

Family	• Support/bonding with:
	
	      - mother
	      - father
	• Family history of substance abuse
	• Family smoking behaviour
	• Parent approval
	• Family discord

School	• School disconnection • Poor grades • Signs of leaving school early
Community	• Neighbourhood disorganization

Table 2

Domain	Protective Factors
Individual	• Social skills • Participation in pro-social activities
Peer	• Peer influence on decision-making
Family	• Parental monitoring
School	• School connection • School grades (GPA)
Community	• Positive adults in neighbourhood • Availability of pro-social activities

Sample

The study was based on a school survey of 3,394 Alberta youth in grades 7 to 12 in October and November 2002. The sample was designed as a stratified random cluster sample with selection proportionate to classroom size. The sample was stratified by five regions aggregated from regional health authority boundaries as they existed in April 2002 and by school grade. The survey was administered in randomly selected classrooms in 89 schools in 39 school divisions throughout the province.

Ethics

Ethics approval was obtained from a duly constituted ethics review board consistent with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (Alberta Heritage Foundation for Medical Research, 2001). The survey was conducted in compliance with the Health Information Act (2001) and the Freedom of Information and Protection of Privacy Act (1995). Active, informed parental consent was required. Youth and parent names were kept confidential by the schools that participated in the survey and research staff had no access to these names.

The questionnaire and survey processes were pre-tested in one school with students in grades 7 to 12 (the French language version of the questionnaire was pre-tested with a French immersion class). Research staff administered an 84-question survey. *The Alberta Youth Experience Survey, 2002: Technical Report* (AADAC, 2003b) outlines measures taken to reduce misrepresentation by students answering the questionnaire. The response rate of 52% is consistent with similar surveys using active informed consent.

Data Analysis

All results reported are based on weighted data, which ensured proper representation from all areas of Alberta. The sample of 3,394 students represents over 263,000 Alberta students in grades 7 to 12. Refer to *TAYES 2002: Technical Report* (AADAC, 2003) for more details on the weighting strategy.

In this report, 16 regression analyses are conducted using forward step-wise regression. Alcohol use, tobacco use, cannabis use, club drug use (ecstasy and crystal meth), and gambling participation (cards, sport events, VLT scratch tabs) are run with 12 risk factors and all eight protective factors. The risk factors that are not included in the analysis are ease of access and grade at first start. Missing values were dealt with using list-wise deletion.

The predictive power of the risk and protective factors is determined by examining the adjusted R square (explained variance) in the regression models. The adjusted R square (explained variance) is the amount of variance accounted for by the independent variable (risk factor or protective factors) on the dependent variable (substance use or gambling participation). If R square =1, then we would be able to predict the dependent variable without error by knowing the independent variable. One hundred per cent of the variance would be explained. In other words, the R square is the proportion of variance in the dependent variable that we can consistently predict using the independent variables.

Strictly speaking, the measures for frequency of use and gambling participation are ordinal. It is acceptable to use ordinal data in regression modeling if the purpose is to determine the relative influence of independent variables on the dependent variable. It is not appropriate to use when estimating population parameters. Thus, the t values in these regression models were compared to determine the most important risk or protective factors. All reported results are statistically significant at the 0.0005 level.

The intention of these multiple regression analyses are not to test hypotheses, but rather to help identify the most important risk and protective factors related to alcohol use, tobacco use,

cannabis use, club drug (ecstasy and crystal meth) use and gambling participation (cards, sport events, VLT scratch tabs) and to explore the predictive power of these risk and protective factors.

There is a distinction between correlation and cause. Correlation does not imply causation.

Most factors are correlates of problems (or the absence of problems) but have not been conclusively shown to predict future problems (or their absence). Where this study finds correlates, it finds possibilities for action—it does not find necessities for action.

RESULTS: RISK FACTORS

REGRESSION ANALYSIS: Frequency of alcohol use in the last 12 months with 12 risk factors

Of the 12 risk factors included in this analysis, 11 are correlated with alcohol use. The relationship between alcohol use and family history of substance abuse is not statistically significant. The most highly correlated risk factors include peer risk behaviour, parental approval of licit and illicit substance use, age, family discord and signs of leaving school early. The peer, family and school context are highlighted. (Refer to Table 3 in the appendix.)

REGRESSION ANALYSIS: Frequency of tobacco use in the last 12 months with 12 risk factors

Of the 12 risk factors included in this analysis, 10 are correlated with tobacco use. The relationship between family smoking behaviour and neighbourhood disorganization with tobacco use is not statistically significant. The most highly correlated risk factors include peer risk behaviour, family discord, signs of leaving school early, parental approval of licit and illicit substances and father support. The peer, family and school context are highlighted. (Refer to Table 4 in the appendix.)

REGRESSION ANALYSIS: Frequency of cannabis use in the last 12 months with 12 risk factors

Of the 12 risk factors included in this analysis, 11 are correlated with cannabis use. The relationship between family smoking behaviour and cannabis use is not statistically significant. The most highly correlated risk factors include peer risk behaviour, parental approval of licit and illicit substance use, signs of leaving school early, father support, and mother support. The peer, family and school contexts are highlighted. (Refer to Table 5 in the appendix.)

REGRESSION ANALYSIS: Frequency of club drug use in the last 12 months with 12 risk factors

Of the 12 risk factors included in this analysis, 11 are correlated with club drug use. The relationship between signs of leaving school early and club drug use is not statistically significant. The most highly correlated risk factors include peer risk behaviour, school disconnection, family smoking behaviour, family discord and family history of substance abuse. The peer, family and school context are highlighted. (Refer to Table 6 in the appendix.)

REGRESSION ANALYSIS: Frequency of gambling participation in the last 12 months (playing cards for money) with 12 risk factors

Of the 12 risk factors included in this analysis, 11 are correlated with the gambling activity of playing cards for money. The relationship between school disconnection and playing cards for money is not statistically significant; nor is the relationship between club drug use and playing cards for money. The most highly correlated risk factors include peer risk behaviour, age, family history of substance abuse, mother support and signs of leaving school early. The peer, family and school contexts are highlighted. (Refer to Table 7 in the appendix.)

REGRESSION ANALYSIS: Frequency of gambling participation in the last 12 months (betting on sporting events with a friend) with 12 risk factors

All 12 risk factors are correlated with the gambling activity of betting on a sporting event with a friend. The most highly correlated risk factors include peer risk behaviour, school disconnection, age, mother support and family smoking behaviour. The peer, family and school contexts are highlighted. (Refer to Table 8 in the appendix.)

REGRESSION ANALYSIS: Frequency of gambling participation in the last 12 months (VLT play) with 12 risk factors

Of the 12 risk factors included in this analysis, 10 were correlated with VLT play. The relationship between school marks and VLT play is not statistically significant; nor is the relationship between family smoking behaviour and VLT play. The most highly correlated risk factors include parental approval of licit and illicit substance use, school disconnection, family history of substance abuse, mother support, and peer risk behaviour. The peer, family and school context are highlighted. (Refer to Table 9 in the appendix.)

REGRESSION ANALYSIS: Frequency of gambling participation the last 12 months (scratch tabs) with 12 risk factors

All 12 risk factors are correlated with scratch tabs. The most highly correlated risk factors include peer risk behaviour, signs of leaving school early, levels of family smoking behaviour, mother support and father support. The peer, family and school contexts are highlighted. (Refer to Table 10 in the appendix.)

Summary of most important risk factors for use of alcohol, tobacco and other drugs and gambling participation

Forward step-wise regression determined which factors are most highly correlated with substance use and gambling participation and which variables are more likely to predict substance use or gambling participation. This information is summarized in Tables 11 and 12. Table 11 shows that 11 risk factors predict alcohol use 55% of the time, 10 risk factors predict tobacco use 18% of the time and so forth. The explained variance (predictive power) decreases with club drug use and gambling participation (cards, sport events, VLT and scratch tabs).

Table 11: Explained Variance and Number of Risk Factors

	Explained Variance	Number of Risk Factors
Alcohol Use	55%	11
Tobacco Use	18%	10
Cannabis Use	40%	11
Club Drug Use	11%	11
Gambling Participation (cards)	14%	11
Gambling Participation (sport events)	7%	12
Gambling Participation (VLT)	5%	10
Gambling Participation (scratch tabs)	6%	10

Table 12 summarizes the most highly correlated risk factors for each substance and gambling behaviour analyzed. From this table, information about risk factors correlated with specific drugs or gambling participation is presented. For example, the most highly correlated risk factors associated with tobacco use are peer risk behaviour, parental approval of licit and illicit substance use, family discord, signs of leaving school early and father support.

Commonalities between the specific substances used, gambling participation and risk factors are also revealed. From a global perspective, levels of peer engagement in risk behaviours is one of the most highly correlated risk factors for all substance use and gambling participation analyzed in this report. Maternal support is one of the most highly correlated risk factors for gambling participation and for club drug use and cannabis use. The next most common risk factor is signs of leaving school early, followed by parental approval of licit and illicit substances. Generally speaking, the peer, family and school domains are important social contexts for adolescent substance use or gambling participation (refer to Table 12).

When the explained variance (predictive power) is compared between risk factors and substance use and gambling participation, there are inconsistencies. The predictive power of risk factors is high for alcohol use and cannabis use, but lower for tobacco use, club drug use (crystal meth or ecstasy) and gambling participation (cards, sports, VLT and scratch tabs).

Table 12: Most Highly Correlated Risk Factors Associated With Substance Use and Gambling Participation in the Last 12 months

Risk Factor	Alcohol Use	Tobacco Use	Cannabis Use	Club Drug Use (ecstasy and crystal meth)	Gambling Participation (cards)	Gambling Participation (sports events)	Gambling Participation (VLT)	Gambling Participation (scratch tabs)
Peer risk behaviour	*	*	*	*	*	*	*	*
Parent approval of illicit and licit substances	*	*	*				*	
Age	*			*	*			
Family Discord	*	*						
Signs of leaving school early	*	*	*		*			*
Low Father Support		*	*					*
Low Mother Support			*	*	*	*	*	*
School Disconnection				*		*	*	
Family Smoking Behaviour				*		*		*
Family History of Substance Abuse					*	*	*	

RESULTS: PROTECTIVE FACTORS

REGRESSION ANALYSIS: Frequency of alcohol use in the last 12 months with eight protective factors

All eight protective factors are correlated with alcohol use. The most highly correlated protective factors include social skills, parental monitoring, school marks, participation in pro-social activities and peer influence in decision-making. The individual, family, school and peer contexts are highlighted. (Refer to Table 13 in the appendix.)

REGRESSION ANALYSIS: Frequency of tobacco use in the last 12 months with eight protective factors

All eight protective factors are correlated with tobacco use. The most highly correlated protective factors include social skills, parental monitoring, availability of pro-social activities, participation in pro-social activities and connection to school. All five of the domains are highlighted (individual, peer, family, school and community). (Refer to Table 14 in the appendix.)

REGRESSION ANALYSIS: Frequency of cannabis use in the last 12 months with eight protective factors

All eight protective factors are correlated with cannabis use. The most highly correlated protective factors include parental monitoring, social skills, participation in pro-social activities, connection to school and number of positive adults in the neighbourhood. The individual, family, school and community domain are highlighted. (Refer to Table 15 in the appendix.)

REGRESSION ANALYSIS: Frequency of club drug use in the last 12 months with eight protective factors

All eight protective factors are correlated with club drug use. The most highly correlated protective factors include social skills, connection to school, peer influence on decision-making, parental monitoring and number of positive adults in the neighbourhood. The individual, school, peer,

family and neighbourhood domains stand out. (Refer to Table 16 in the appendix.)

REGRESSION ANALYSIS: Frequency of gambling participation in the last 12 months-playing cards for money with eight protective factors

Seven out of eight protective factors are correlated with playing cards for money. School grades (GPA) are not significantly associated with playing cards for money. The most highly correlated factors include social skills, parental monitoring, participation in pro-social activities, connection to school, and number of positive adults in the neighbourhood. The individual, family, school and neighbourhood domains are highlighted. (Refer to Table 17 in the appendix.)

REGRESSION ANALYSIS: Frequency of gambling participation in the last 12 months-betting on sporting events with friends with eight protective factors

All eight protective factors are correlated with betting on sporting events with friends. The most highly correlated factors include connection to school, peer influence on decision-making, availability of pro-social activities, parental monitoring and number of positive adults in the neighbourhood. The school, peer, community and family domains are highlighted. (Refer to Table 18 in the appendix.)

REGRESSION ANALYSIS: Frequency of gambling participation in the last 12 months-VLT play with eight protective factors

All eight protective factors are correlated with VLT play. The most highly correlated factors include connection to school, peer influence on decision-making, availability of pro-social activities, parental monitoring and number of positive adults in the neighbourhood. The school, peer, community and family domains are highlighted. (Refer to Table 19 in the appendix.)

REGRESSION ANALYSIS: **Frequency of gambling participation in the last 12 months-scratch tabs with eight protective factors**

Six out of eight protective factors are correlated with VLT play. School grades (GPA) and connection to school are not significantly associated with gambling with scratch tabs. The most highly correlated factors include parental monitoring, social skills, number of positive adults in the neighbourhood, peer influence on decision-making, and availability of pro-social activities. The family, individual, community and peer domains are highlighted. (Refer to Table 20 in the appendix.)

Summary of most important protective factors for alcohol, tobacco and other drug use and gambling participation

Forward step-wise regression determined which factors are most highly correlated with substance use and gambling participation and which variables are more likely to predict substance use or gambling participation. This information is summarized in Tables 21 and 22. Presented in Table 21, eight protective factors predict alcohol use 43% of the time, eight protective factors predict tobacco use 16% of the time and so forth. The explained variance decreases with club drug use and gambling behaviours (cards, sport events, VLT and scratch tabs). The same pattern occurs when the predictive power of risk factors with gambling participation (cars, sports, VLT and scratch tabs) and club drug use are examined (refer to Table 11).

Table 21: Explained Variance and Number of Protective Factors

	Explained Variance	Number of Protective Factors
Alcohol Use	43%	8
Tobacco Use	16%	8
Cannabis Use	26%	8
Club Drug Use	11%	8
Gambling Participation (cards)	12%	7
Gambling Participation (sports)	12%	8
Gambling Participation (VLT)	7%	8
Gambling Participation (scratch tabs)	9%	8

Table 22 summarizes most highly correlated protective factors for each substance and gambling behaviour analyzed. For example, the most highly correlated protective factors with tobacco use are parental monitoring, social skills, availability of pro-social activities, participation in pro-social activities and connection to school.

Commonalities between the specific substances, gambling behaviours and protective factors are also revealed. From a global perspective, parental monitoring is one of the most important protective factors for all substance use and gambling participation analyzed in this report. Social skills are the next most common protective factor. Social skills are one of the most important protective factors for all substance use and gambling participation except for VLT play. The next most common protective factor is number of positive adults in the neighbourhood, followed by peer influence on decision-making. Generally speaking, the family, individual, community and peer domains are important protective social contexts for adolescent substance use or gambling participation (refer to Table 22).

When the explained variance (predictive power) is compared between substance use and gambling participation, there are inconsistencies. The predictive power of alcohol use and cannabis use is high when analyzed with the protective factors framework. It is lower for tobacco use, club drug use (crystal meth or ecstasy) or gambling participation (cards, sports, VLT and scratch tabs). As mentioned previously, this same pattern occurs with risk factors and tobacco, club drug use (crystal meth or ecstasy) or gambling participation (cards, sports, VLT and scratch tabs): the explained variance is lower than for alcohol or cannabis use.

Table 22: Most Highly Correlated Protective Factors Associated With Substance use and Gambling Participation in the Last 12 months

Protective Factor	Alcohol Use	Tobacco Use	Cannabis Use	Club Drug Use (ecstasy and crystal meth)	Gambling Participation (cards)	Gambling Participation (sports events)	Gambling Participation (VLT)	Gambling Participation (scratch tabs)
Parental monitoring	*	*	*	*	*	*	*	*
Social Skills	*	*	*	*	*	*		*
Number Positive adults			*	*	*	*	*	*
Peer influence on decision-making	*			*		*	*	*
Availability of pro-social activities		*					*	*
School marks	*		*					
Participation in pro-social activities		*	*		*	*		
Connection to school		*		*	*		*	

DISCUSSION AND CONCLUSIONS

There are common and specific risk and protective factors associated with alcohol, tobacco and other drug use or gambling participation across social domains. The predictive power of these factors varies, with alcohol and cannabis use most strongly predicted. Risk factors account for 55% of the explained variance in alcohol use and 40% in cannabis use. For risk factors and other examined behaviours (use of all other substances and gambling participation), explained variance ranges from 5% to 18%. Protective factors account for 43% of the explained variance in alcohol use and 26% in cannabis use. For protective factors and all other substance use and gambling participation, explained variance ranges from 7% to 16%. For a detailed description of risk and protective factors included in TAYES 2002, refer to *Risk and Protective Factors Associated with Grade (Grades 7 to 12)* (AADAC, 2004b).

The most important risk factor common to all substances and gambling participation is peer risk behaviour. Peer risk behaviour reflects youth smoking cigarettes, drinking alcohol or breaking the law. The most important protective factor common to all substances and gambling participation is parental monitoring. Parental monitoring refers to parents' knowledge of where their adolescent is after school, who they go out with at night, or where they are at night. Each substance and gambling behaviour is also identified by unique risk and protective factors. For example, age is one of the most highly correlated risk factors for alcohol use; it is not for tobacco use (refer to tables 3 and 4 in the appendix). These results support the need for both targeted and broad-based programs.

For both alcohol and cannabis use, the most important risk factors are peer risk behaviours, parental approval of licit and illicit substance use and signs of leaving school early. Parental approval refers to whether or not parents approve of their adolescent smoking tobacco, drinking alcohol or using drugs. Signs of leaving school early include adolescents that report they missed a whole day of school because they "cut" class or for some other reason. For alcohol use, age and family discord are the most important. Family discord refers to youth's perception of how well they think their parents get along. For cannabis use, father and mother support are most important. Parental support refers to youth's perception of the nature and closeness of their relationship to either parent.

The most important protective factors common to alcohol and cannabis use include social skills, parental monitoring, school marks (GPA), and participation in pro-social activities. Social skills refer to an adolescent's ability to handle difficult situations, such as being able to say no to friends. Examples of pro-social activities include church groups and community sports (evenings and weekends).

The most important protective factor associated with alcohol use is peer influence in decision-making. Peer influence refers to situations where friends push each other to succeed or when close friends' opinions are taken into account. The most important protective factor associated with cannabis use is the number of positive adults in the neighbourhood (refer to Table 13 and Table 15 in the appendix). Positive adults are defined as individuals who encourage the youth in their communities to do their best, notice when youth are doing a good job and tell them that they are proud of them.

The risk and protective factors associated with gambling behaviours, club drug use and tobacco use, have relatively low predictive power. One of the limitations of TAYES 2002 is that we did not include risk factors about parental approval of gambling participation or whether there was a family history of gambling. Omission of these risk factors may help explain the lower predictive power found with gambling behaviours compared to alcohol or cannabis use.

According to the literature, those who use club drugs are also more likely to use cannabis. If the

analyses had combined both club drug and cannabis users, the predictive power for these substances could increase. Future analysis should investigate this possibility as well.

When research on risk and protective factors are compared, the literature on protective factors is more recent thus not as conclusive (AADAC, 2004b). A plausible explanation for somewhat lower explained variance is that protective factors may also act as mediator variables or buffer variables that have an indirect influence on tobacco use, club drug use or gambling participation. The analysis chosen in this report examined risk and protective factors independently. Because the analysis did not look at the factors simultaneously, the impact or presence of resilience is not explored. Resilience has been defined as the ability to bounce back in spite of the presence of risks or hazards. Adolescents bounce back from adversity as a result of the strengths and capacities among the protective factors that exist within individuals and their environments counteracting the impact of risk factors (George et al., 2002). More complex statistics are needed to address this. It is important to put into perspective the findings in this report. The lower explained variance or predictive powers of protective factors does not necessarily mean protective factors are unimportant.

The risk and protective factors that are related to the frequency of substance use or participation in gambling are also related to harmful consequences and dependence. Previous research also states that the number of risk and protective factors is important (AADAC, 2003a). This research confirms that finding and also confirms that the strength of each of the factors is important. This verifies the notion that not only prevention but also intervention and treatment programs can benefit by utilizing a risk and protective factors framework.

The analysis in this paper is a deeper level of description than was done in previous TAYES 2002 reports on risk and protective factors (AADAC, 2004a; AADAC, 2004b). Surveys of this kind, however, do not determine causality. The multiple regression results focus on the most important risk and protective factors related to use of substances and gambling participation.

As adolescents develop, their interactions within and across social domains (individual, family, peer and community) change. The risk and protective factors framework sheds light on commonalities among factors and highlights factors that relate uniquely to the use of certain substances or to certain forms of gambling. This knowledge aids the development of effective targeted and broad-based programs (Levin & George, 2003).

APPENDIX

Tables 3 through 10 present data on the most important risk factors associated with substance use and gambling participation.

Table 3

The Most Important Risk factors Associated with Frequency of Alcohol Use
Peer risk behaviour
Parental approval of licit and illicit substance use
Age
Family discord
Signs of leaving school early

Table 4

The Most Important Risk Factors Associated With Frequency of Tobacco Use
Peer risk behaviour
Family discord
Signs of leaving school early
Parental approval of licit and illicit substance use
Father support

Table 5

The Most Important Risk Factors Associated With Frequency of Cannabis Use
Peer risk behaviour
Parental approval of licit and illicit substance use
Signs of leaving school early
Father support
Mother support

Table 6

The Most Important Risk Factors Associated With Frequency of Club Drug Use
Peer risk behaviour
School disconnection
Family smoking behaviour
Family discord
Family history of substance abuse

Table 7

The Most Important Risk Factors Associated With Frequency of Gambling Participation (Cards)
Peer risk behaviour
Age
Family history of substance abuse
Mother support
Signs of leaving school early

Table 8

The Most Important Risk Factors Associated With Frequency of Gambling Participation (Sporting Events)
Peer risk behaviour
School disconnection
Age
Mother support
Family smoking behaviour

Table 9

The Most Important Risk Factors Associated With Frequency of Gambling Participation (VLT)
Parental approval of licit and illicit substance use
School disconnection
Family history of substance abuse
Mother support
Peer risk behaviour

Table 10

The Most Important Risk Factors Associated With Frequency of Gambling Participation (Scratch Tabs)
Peer risk behaviour
Signs of leaving school early
Family smoking behaviour
Mother support
Father support

Tables 13 through 20 present data on the most important protective factors associated with substance use and gambling behaviours

Table 13

The Most Important Protective Factors Associated With Frequency of Alcohol Use
Social skills
Parental monitoring
School marks (GPA)
Participation in pro-social activities
Peer influence in decision-making

Table 14

The Most Important Protective Factors Associated With Frequency of Tobacco Use
Social skills
Parental monitoring
Availability of pro-social activities
Participation in pro-social activities
Connection to school

Table 15

The Most Important Protective Factors Associated with Frequency of Cannabis Use
Parental monitoring
Social skills
Participation in pro-social activities
School marks (GPA)
Positive adults in neighbourhood

Table 16

The Most Important Protective Factors Associated With Frequency of Club Drug Use (Crystal Meth and Ecstasy)
Social skills
School connection
Peer influence on decision-making
Parental monitoring
Positive adults in the neighbourhood

Table 17

The Most Important Protective Factors Associated With Frequency of Gambling Participation (Cards)
Social skills
Parental monitoring
Participation in pro-social activities
Connection to school
High positive adults in neighbourhood

Table 18

The Most Important Protective Factors Associated With Frequency of Gambling Participation (Sporting Events)
Parental monitoring
Participation in pro-social activities
Peer influence on decision-making
Social kills
Positive adults in neighbourhood

Table 19

The Most Important Protective Factors Associated With Frequency of Gambling Participation (VLT)
Connection to school
Peer influence on decision-making
Availability of pro-social activities
Parental monitoring
Positive adults in the neighbourhood

Table 20

The Most Important Protective Factors Associated With Frequency of Gambling Participation (Scratch Tabs)
Parental monitorins
Social skills
Positive adults in neighbourhood
Peer influence on decision-making
Availability of pro-social activities

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