

FACTORS INFLUENCING THE DEVELOPMENT OF RESPONSIBLE GAMBLING: A PROSPECTIVE STUDY

(Update November 5th, 2004)

N. el-Guebaly ¹, D. Hodgins ², G. Smith ³, R. Williams ⁴, V. Williams ⁵,
D. Schopflocher ⁶, R. Wood ⁷, M. Pickup ⁸

- 1: Professor and Head, Addiction Psychiatry, University of Calgary; Chair, Alberta Gaming Research Institute.**
- 2: Professor, Dept of Psychology, University of Calgary**
- 3: Professor Emeritus, University of Alberta**
- 4: Associate Professor, University of Lethbridge**
- 5: CEO, Alberta Gaming Research Institute**
- 6: Biostatistician, Alberta Health & Wellness; Adjunct Associate Professor Epidemiology, University of Alberta**
- 7: Assistant Professor, Dept of Sociology, University of Lethbridge**
- 8: Project Coordinator, Alberta Gaming Research Institute Cohort Study**

Web site: www.abgaminginstitute.ualberta.ca/private/cohort.htm

Proposal's Background and Acknowledgements

Upon creation in 1999, the Board of the Alberta Gaming Research Institute commissioned a set of literature reviews in the biopsychosocial, sociocultural, policy and economic domains of gambling research. A controversy in interpreting the significance of various domain variables and the lack of cross-over studies was highlighted. Support was received at the joint Council-Board meeting on March 23rd, 2001 for a major collaborative project to ensure an enduring made in Alberta scientific legacy in the field of gambling. As a result, over the last three years a core group of researchers – including the node coordinators from the University of Alberta, Dr. Garry Smith, the University of Calgary, Dr. David Hodgins and the University of Lethbridge, Dr. Robert Williams, as well as Ms. Vickii Williams, Executive Director and Dr. Nady el-Guebaly as Chair – met several times to plan the project. Recommendations from external reviews resulted in the addition of Dr. Donald Schopflocher, a senior biostatistician and Dr. Robert Wood, sociologist. The process involved several phases including an initial review of the relevant literature, a discussion regarding optimal design and the selection of a model to be tested, the selection of instruments to be administered, ethical issues to be addressed and lastly an estimate of the resources required.

The initial literature review included methodology papers on prospective designs. The support of research assistants, Adam Engstrom from University of Alberta, Kylie Thygessen from University of Calgary and Lisa Lewis from University of Lethbridge as well as Rhys Stevens, Institute Librarian is gratefully acknowledged. With further Council-Board endorsement at the May 2002 retreat, Ronaye Coulson updated and completed the review as well as collated relevant instruments. Since then, several consultations were held resulting in Board approval of the project for funding on April 2004. The appointment of Mark Pickup as Project Coordinator has facilitated the completion of this submission. At the same time, discussions are ongoing with Ontario's Problem Gambling Research Centre, the CIHR's Institute of Neurosciences, Mental Health and Addictions and several other provinces to expand aspects of the project.

Earlier suggestions from Dr. Ken Winters and Dr. Heather Bryant are hereby gratefully acknowledged. Thanks are also extended to four additional anonymous reviewers for their helpful comments.

Executive Summary

Gambling is a normative activity in the Alberta population, with 82% of the adult population having gambled in the past year. Although the large majority of Albertans gamble responsibly, there is a small percentage that experience significant problems. The design of effective educational and legislative strategies to minimize the harm caused by gambling hinges on understanding the factors that promote responsible gambling and/or make people susceptible to problem gambling.

Longitudinal studies are the optimal methodology for investigating such questions. This methodology has been used extensively and successfully in the fields of health, mental health, sociology and addiction. Unfortunately, there exist virtually no longitudinal studies of gambling. It is this important gap in the research literature that provided the impetus to assemble a cross-disciplinary and cross-university Alberta research team to develop the present proposal.

The present project intends to study prospectively 2000 Albertans over a 5-year period from 2005 to 2010. There will be 5 age cohorts with 400 in each cohort: 13-15 year olds; 18-20 year olds; 23-25 year olds; 43-45 year olds; and 63-65 year olds. Fifty percent of each cohort will be derived from the general population and fifty percent from a 'high risk' sample of individuals who are at elevated risk for developing gambling problems because of their greater expenditure and frequency of gambling. The entire sample will be selected by means of random digit dialing, stratified by region (Edmonton, Calgary, rural Alberta). The initial interview will be conducted face-to-face, preceded by an introductory telephone interview and will comprehensively assess all individual and societal variables potentially relevant to gambling behavior. Individuals will be contacted a minimum of four more times, on an annual basis. These assessments will allow for face-to-face, mail-in, telephone, or web-based assessment for greater convenience and to maximize retention. In addition, a small percentage of individuals will be asked to keep prospective diaries throughout the year.

Factor analysis and repeated measures analyses will be used to fine-tune the constructs and causal relations underlying our biopsychosocial model of gambling. Hierarchical Linear Modelling (HLM) and Structural Equation Modeling (SEM) will then be used to test the final model. The development of a comprehensive model of gambling behavior will elucidate several questions: What are the normal patterns of continuity and discontinuity in gambling behavior? What biopsychosocial variables and behavior patterns are most predictive of current and future responsible gambling and problem gambling? What is the impact of gambling availability, legislative initiatives, and prevention programs on the development of problem and responsible gambling? And, how do all of these things vary as a function of age and gender? These are all questions whose answers will inform effective educational and legislative initiatives to maximize the benefits of gambling and minimize the harm. Finally, it is anticipated that the richness of the resulting database will also serve as a valuable resource for other non-gambling investigations by other research groups.

Table of Contents

A. Review and Trends of Prospective Studies	page 6
B. The Proposed Research Design	page 14
C. Conceptual Framework to be tested	page 29
D. Selection of Instruments	page 36
E. Data Analysis	page 44
F. Ethical Considerations	page 46
G. Estimated Budget.....	page 49
H. Organizational Structure	page 51
I. Anticipated Benefits	page 52
J. Appendices:	
#1: Longitudinal Studies in the Field of Addictions	page 53
#2: Communités.....	page 95
#3: Instruments and Interview Structure	page 96
References: Appendix 3.....	page 108
#4: The Search for Genetic Polymorphism-Blood Sample: 10ml.....	page 110
#5: Consent Forms	page 112
#6: Estimated Budget.....	page 121
#7: Cohort Screener (Normal Sample)	page 127
K. References (Sections A-J).....	page 129
Addendum 1: Investigator's CVs.....	page 146

A. REVIEW AND TRENDS IN PROSPECTIVE STUDIES (See Appendix 1)

Howard Shaffer et al (2004) note that there are currently more than 200 studies of gambling prevalence but few studies of gambling incidence and even fewer studies of the determinants of gambling and disordered gambling. They suggest that it is time gambling research turn to the study of determinants. It is in this spirit that a prospective, longitudinal study of gambling is proposed.

An extensive literature review was conducted in the fields of mental health, sociology and addiction to identify longitudinal prospective studies with a multidisciplinary focus of at least 5 years duration, from 1985 on, and with a sample size of at least 200. The goal was to identify the opportunities and yield created by a prospective design. We also retrieved methodology papers that reviewed the benefits and limitations of a prospective design.

The computerized search yielded the information tabled in Appendix 1. It includes some 140 references and 10 methodology papers. It is to be especially noted that only one published systematic prospective study focussing on gambling behavior was retrieved , i.e., in a sample of adolescents and young adults in Minnesota studied by Ken Winters et al (2002). In Buffalo, Grace Barnes et al (1999), added gambling questions in her studies of adolescents with substance use and delinquency problems. In Quebec, Vitaro et al (1996) included gambling behavior in examining the predictive value of a mother-teacher questionnaire administered two years prior to a survey of 13-year old boys.

The literature search in the fields of mental health, sociology and addiction presented information about design and methodology, instruments commonly utilized in longitudinal studies, and variables typically examined. The trends and commonalities identified amongst previous longitudinal studies help to point out the direction and design issues of future research endeavors. Aside from incidence and prevalence data,

most studies focused on nature and nurture predictors of risk and only a few monitored the outcome of specific interventions.

Mental Health

In this field, several trends have emerged amongst longitudinal investigations. A common feature is that most draw upon information and data gleaned from earlier critical studies (such as the Christchurch Health and Development Study - Fergusson, Horwood, & Lynsky, 1994; the National Longitudinal Study of Adolescent Health – Jacobson & Rowe, 1999; and the National Child Development study – Buchanan, Ten, Brinke, & Flouri, 2000). Numerous variables have been examined and the variables of interest generally became more specific and in-depth during the progression from the late 1980's to the new millennium. For example, earlier studies examined such variables as sex differences in adolescent psychopathology (Almqvist, 1986) as well as parental separation and risk of problems (Fergusson, Horwood, & Lynskey, 1994). However, later studies tended to narrow their focus on such variables as family connectedness, school connectedness, and adolescent depressed mood (Jacobson & Rowe, 1999), as well as parental care and background as predictors of later psychological problems (Buchanan, Ten, Brinke, & Flouri, 2000).

As recognized by various authors, there were limitations inherent in many of the longitudinal research studies examining mental health. For example, earlier studies used measures that did not define specific individual, environmental, or family antecedents (Almqvist, 1988); others used either dated data or relied primarily on self-report (Buchanan, Ten, Brinke, & Flouri, 2000; Nader et al., 1999); and an accelerated longitudinal research study on child psychopathology, performed by Stanger, Achenbach and Verhulst (1994), confounded age effects.

Sociology

The review of longitudinal studies conducted in the political science, social psychology, anthropology, economics, and sociology domains likewise revealed similar trends. Once more, a vast array of variables were investigated including: alcohol consumption

(Adams et al., 1990; Bergmark & Anderson, 1999; Ghodsian & Power, 1987), smoking (Akers & Lee, 1996), offending and antisocial behaviors (Farrinon, 1995), changes in drinking after sociopolitical change (Kubicka, Csemy, & Kozeng, 1995), marital quality and effective parenting (Lindahl, Clements, & Markham, 1997), control over one's life (Lewis, Ross, & Mirowsky, 1999), family dysfunction and perpetuation of dating violence by adolescent boys (Lavoie et al., 2002).

During the mid-1980's, a number of studies took place examining the transition from adolescence to young adulthood, particularly focussing on changes in substance use (eg. Ghodsian & Power; Newcomb & Bentler, 1986). However, in the mid to late 1990's, researchers in these social science domains increasingly began to explore the predictors of certain behaviors. For example, Dobkin et al. (1995) investigated variables that predict substance abuse in boys of low socioeconomic status; Farrinon (1995) focussed on predicting the development of offending and antisocial behavior in boys from childhood to young adulthood; Kaskutas et al. (1997) observed the predictors of help-seeking behavior for alcohol-related problems among the general population; and finally Kiernan (1997) looked at the social, economic, and educational predictors of becoming a young parent.

In the late 1990's examining resiliency, protective, and risk factors via longitudinal studies was popular. This trend highlights the advantage that longitudinal studies have in effectively and efficiently capturing such information. Examples of such studies include the following: examination of the factors that effect the resiliency of youth with a disadvantaged history (Fergusson & Lynsky, 1996); observation of protective factors in late adolescence and their relationship with future criminality (Stattin, 1997); examination of early risk factors and the development of drinking habits (Bergmark & Anderson, 1999); and looking at the risk factors for long-term smoking continuation (Nordstrom, Kimmen, Utman, Krall, Vokonas, & Garvey, 2000).

Addiction

This field has produced an abundant quantity of informative studies on alcohol, drug, and cigarette use, dependence, and abuse. Studies have investigated addiction across most age groups and within most age groups. They have focussed on addiction treatment and outcomes, as well as the associated risks, costs, and relationships of various addictions. During the past 17 years of longitudinal studies, certain topics have remained relatively unchanged, yet other research areas have developed and increased in sophistication quite dramatically.

The examination of children of alcoholics has been a popular research area throughout the past few decades, whether it is investigating psychosocial influences on children (Beardslee, Son, & Vailant, 1986), the risks of positive family histories of alcohol abuse (Jennison & Johnson, 1998; Pandina & Johnson, 1990; Schulsinger et al., 1986), gender differences (Muetzell, 1995), risk of psychiatric disorders (Schuckit & Smith, 1996), or even temperament and academic performance consequences (Vitaro et al., 1996).

The benefit of studying addictive behaviors longitudinally is evident in a number of studies that observed changes in substance use over a substantial period of time. For example, Neve et al. (1993) studied cohort alcohol use by combining various studies from the past 5 decades to determine changes and patterns in use with increasing age. Likewise, Chen, Scheier, and Kandel (1996) followed subjects from high school until mid-30's to observe changes in cocaine use and associated health consequences, Oyefeso et al. (1999) followed successive cohorts for 20 years to investigate mortality associated with teen drug use, and Kandel and Conrad (2000) studied marijuana use over a 19 year period (adolescence to adulthood) and its associated risks and patterns.

Another trend common to the longitudinal studies performed in the addictions field in the past few decades is the investigation of the pathology, mortality, and suicide associated with substance use and addiction (e.g. Chen, Scheier, & Kandel, 1996; Holder & Blose, 1992; Muetzell, 1994; Rossow & Amundsen, 1995; Rossow & Amundsen, 1996;

Vaillant, Schnurr, Baron, & Gerber, 1991). In addition, the relationships between different types of substance abuse with each other and with psychosocial correlates have been commonly investigated (eg. Gotham, Sher, & Wood, 1997; Hawkins, Graham, Maguin, Abbott, Hill, & Catalano, 1997; Hofman, Barnes, Welte, & Dintcheff, 2000; Jackson, Sher, & Wood, 2000; and Sher, Gotham, Erickson, & Wood, 1996).

Similar to studies performed in the social science domains, the addictions field has increasingly utilized longitudinal studies to analyze the protective, risk, and resiliency factors associated with addictions. For example, Griffiths (1990, 1995), Griffiths and Wood (2000), and Vitaro, Ladouceur, and Bujold (1996) examined risk factors involved with gambling addiction; Swaim (1991), Newcomb (1997), and Wills, Vaccaro, and McNamara (1992), examined risk and protective factors associated with substance abuse; and Schulenberg et al. (1996), and Griffin et al. (2000) similarly examined risk factors in binge drinking

Prospective Studies of Gambling Behaviors and Problems

As is apparent in the longitudinal study literature from the past 2 decades, a very limited number of published investigations have examined gambling behaviors and problems prospectively. They are compared in Table I. Vitaro et al. (1996) conducted a two-stage “portrait of adolescents in Quebec”. Teacher and mother ratings of behavior of 10-11 year old adolescent boys were compared with the adolescents’ self-reports at age 13. Gambling behavior was linked to delinquency and substance use.

Barnes et al. (1999) examined the predictors of both gambling and alcohol use by combining data from two separate studies. This report utilized adolescent participants, and did not pay heed to the potential progression and changes inherent in gambling behaviors across cohorts. Winters et al. (2002) studied youth, and young adulthood specifically examining gambling behaviors. The mean age at baseline for this study was 16 years and the participants were followed for 8 years, thereby obtaining information relevant to the course and outcome of gambling behaviors in adolescence and young adulthood, but not beyond.

Recently, Slutske et al. (2003) in an 11-yr, four wave longitudinal study spanning adolescence through young adult years (n=468) found that the past year prevalence, 3-4 year incidences and the lifetime prevalence of problem gamblers from adolescence through young adulthood were relatively stable at 2-3%, 1-2% and 3-5% respectively. Despite the stability of the prevalence at the aggregate-level, problem gambling appeared to be more transitory and episodic than enduring and chronic at the individual level.

There are also to the best of our knowledge 2 other prospective studies related to gambling that are unpublished. They include the Abbott et al. (1999) 7-yr follow-up in New Zealand of 143 regular and problem gambling adults identified from a national gambling survey. Twenty-three participants were diagnosed with past-six-month problem or pathological gambling at baseline in 1991 but not at the follow-up in 1998, 12 participants were diagnosed at both baseline and follow-up and, seven participants were diagnosed at follow-up but not at baseline.

Another study by Cottler and Cunningham-Williams (1998) is an 11-yr follow-up of 162 adult drug users from the Epidemiological Catchment Area study in the St. Louis site. In that high-risk population, an 11-yr incidence rate of problem/pathological gambling amounted to 12%. An association between childhood conduct problems and becoming a problem gambler was elicited but no other psychiatric condition discriminated between various causes of gambling behavior. There was also an association between developing gambling problems and developing alcohol problems.

Conclusion

This review presents evidence that longitudinal studies have become increasingly popular. The last two years alone have produced a plethora of studies with a duration of five years or more, allowing for the generation of a myriad of useful findings. In addition, the designs of such studies have become increasingly sophisticated and theory-driven. Based on frequency of citations, the Christchurch Health and

Development Study is identified as high impact. From our review, the study of gambling behaviors remains relatively unexplored. This conclusion is similar to the one reached by the review of pathological gambling published by the US National Research Council in 1999 calling for “longitudinal research that explores the transition from childhood to adolescence through later adulthood to determine the natural history of pathological gambling” (p 142-143). A prospective study investigating a broad net of variables while building on the information generated by earlier work is therefore justified.

TABLE 1: LONGITUDINAL STUDIES OF GAMBLING BEHAVIORS AND PROBLEMS

Prospective Study/Method	Vitaro et al '96	Barnes et al '99	Winters et al '93 & '02	Slutske et al '03
SAMPLE	- 631 boys, 1-10 boys/school, throughout Quebec Self-report: gambling, substance use & delinquency embedded in "adolescent life" questionnaire i.e., school, dating, health All 1 at 10-11y: teacher & mother ratings of behavior (hyperactivity/inattention, impulsivity, anxiety/youth drama), aggressiveness/antisocial, parental occupation (Blishen & McRobert's) All 2 at 13 y: boys' gambling (8 items: frequency & amount); delinquency (27 items); substance use (38 items)	Study I: adolescent & family 6 waves 1989-96; 639 adolescents from 13-16 until 18-22 recruited through random-digit-dial sampling. Families paid US\$50 at W1 & \$75 at W2-3. Then individuals paid US\$25 at W4-6 All 1 completion 71% of all families; 77% among blacks Study II: delinquency in young men 3 waves; 625 males ages 16-19 initially. Retention rates 97% whites & 94% blacks. All 5-6 of study I and Study II, question about gambling frequency: How many times gambled at each of 11 types over past year? (5 options) & SOGS	Cohort of 305 young adults, assessed at: T1 - 1990 T2 - 1992 T3 - 1997-98 Mean ages: 16.0, 17.6 & 23.8 respectively. 49% F, 96% W/White At T3: 95% high school degree & 86% in Minnesota At T1: telephone list of households likely to have adolescent, random sample, 23% refusal but T1 similar to Minnesota youths. Attrition at T2: 24% but participants aside from being slightly younger were no different At T3: sample of low and high risk group; high risk = prior year gambling at least weekly; SOGS-R ≥ 2 .	- 468 freshmen, age 18-19, 46% male; stratified according to parental alcohol problems - reassessment + years 1, 4, 7 & 11; major focus alcohol use - Follow rates: 97%, 94%, 84%, 84% & 84%
INTERVIEW	Self-report questionnaires in a school survey "portrait of adolescents in Quebec"	Study I: Two interviewers visited home to see target adolescent & 1-3 family members at W1-3, then adolescent & peers seen at the office W4-6. Study II: conducted at office	Telephone by undergrad or grad RA's: demographics, prior year gambling, frequency for 11 activities, prior year gambling related problems (SOGS-R & SOGS), prior year alcohol & other drug frequency, mental health status, school achievement, delinquent behavior & parental gambling history. Up to 20 call backs over 4 weeks & parental consent for minors.	Lifetime and past year involvement in gambling activities, pathological gambling (DIS)
ANALYSIS	MANCOVA	Log transformation MANOVA separately for each study	- Delete questionnaire if more than 10% of items unanswered or multiple responses - Factor analysis to reduce common factors - Descriptive statistics of gambling trends - Odd ratios & logistic regression for predictors	Individual developmental trajectories of problem gambling plotted prediction of problem. Logistic regression.
ODDS OF PROBLEM GAMBLING AT YOUNG ADULTHOOD	- Gambling linked to delinquency & substance use: moderate but significant, stronger relation between delinquency & substance use - Low harm avoidance may be an antecedent (inhibition deficit) rather than impulse control deficit (different from adults?) - Cognitive deficit not surveyed but discussed	- Gambling & alcohol consumption co-occur & are linked with other behaviors such as cigarette smoking, illicit drug use & delinquency - Similar socio-demographics: more males, whites, higher SES in alcohol. - Significant personality predictors: impulsivity & moral disengagement - Parental monitoring relevant for alcohol, not gambling - Parents &/or peers gambling? Amount of money vs alcohol quantity? Earliest onset: alcohol, gambling or delinquency?	1. Parental history 2. Problem gambling during adolescence 3. Male 4. At risk gambling during adolescence 5. Substance abuse 6. Poor school performance	- Past year prevalence (2.3%); year incidences (1.2%) and Lifetime Prevalence (3-5%) - Relatively stable at aggregate level but transitory & episodic at individual at individual level

B. The Proposed Research Design

Research Questions underlying the Design

From the literature review, a unique and significant contribution may be achieved by examining the following five broad questions:

- What is the **prevalence of gambling behaviors** (type, range and degree of involvement) across the lifecycle and in both genders?
- What are the **patterns of continuity and discontinuity (including incidence)** in gambling behaviors as well as patterns of recovery from problems?
- What behavior patterns constitute **responsible or problem gambling**?
- What is the impact on the various age cohorts of the **changes that will occur within 5 years in gambling legislation, public attitudes and availability of preventive programs**?
- What are the **biopsychosocial variables (risks and resilience) predicting the spectrum of gambling behaviors** from responsible to problematic?

For the purposes of this project the following terminology was defined:

- **Responsible Gambling** is each person exercising a rational and sensible choice based on his or her individual circumstances. Gambling is currently non-problematic and does not constitute a significant risk for future problematic gambling (Dickerson, 2003)
- **Problem Gambling** is gambling that causes significant hardship for a person or other people in a person's immediate primary social network (Ferris, Wynne & Single, 1999).

A longitudinal multiple cohort study is the optimal research design to address these questions. We recommend a study that will unfold over five years. The study will consist of a recruitment phase by telephone interview through random digital dialing (RDD), initial face-to-face and telephone interviews, and four additional yearly follow-up interviews. The initial sample will consist of 2000 subjects sampled equally in five age groups and divided equally into high frequency gamblers and the general population.

Advantages of Longitudinal Design

1. The study of continuities and discontinuities in individual development and behaviors, as well as factors that influence these processes, is crucial to our understanding of normal and abnormal functioning. From the literature on normative and problem behavior, research concerning the individual course of conditions and knowledge of the processes underlying changes in development is necessary to assess which problems do and do not persist. It is necessary in order to assess which early factors predict adult resilience and pathology. Further, it is required to evaluate the necessity and efficacy of treatment and prevention, to reveal causative mechanisms and to assess the validity of diagnostic constructs in terms of outcome (Verhulst & Koot, 1991).
2. Longitudinal data provide an opportunity to investigate variations over time within individuals as well as investigating variations between individuals whereas cross-sectional surveys allow only the study of variations between individuals. Longitudinal data offer the following opportunities:
 - a. To assess changes in individual development by comparing the same subjects at different times; only in this way can age of onset and the termination of a problem behavior as well as changes in its manifestation be determined.
 - b. To identify mediating and moderating factors by demonstrating that changes in one factor are followed by changes in another; without the time dimension, it is not possible to determine the direction of influence.
 - c. To study ‘escape’ from adverse environmental circumstances or events and to evaluate the factors fostering resilience to adversity.
 - d. To investigate how far later functioning can be predicted by earlier functioning or events (Verhulst & Koot, 1999; Rutter, 1981).

In addition, in the field of gambling, the creation of a cohort will allow for:

- e. The first determination of a population-based incidence of gambling behavior across the life-cycle. To date only prevalence data are available (Shaffer & Hall, 2003).

- f. The development of a common data pool available to researchers from all domains. A common data pool in the long run is more cost-effective than the creation of new data pools for each new project.

Limitations of Longitudinal Design

1. *Limited comparability across studies:* The lack of standardized assessment procedures and a lack of operational definitions of diagnostic syndromes limit the comparability of results across different studies as well as across time periods. It is also recognized however, that one way of testing the measures of pathology or resilience is the power to predict over time. Stability across time provides some support for the validity of measures or diagnostic constructs. At the same time, low stability may indicate valid transient behaviors of considerable concern during the time they are present (Verhulst & Koot, 1991).
2. *Confounding aging and period effects:* a **cohort** is defined as a group of individuals experiencing the same event (often birth) during the same time period. **Cohort effects** follow from membership of one cohort rather than another (ex. “Baby-boomer” effect). **Period effects** refer to influences specific to a particular time period (ex. the multiplication of gambling opportunities). **Aging effects** refer to changes that occur with age (ex. age-dependent selection of leisure activities). Cross-sectional data confound aging and cohort effects whereas longitudinal data confound aging and period effects. It is necessary therefore to devise some method of disentangling aging and period effects (Farrington, 1991; Glenn, 1977).
3. There is, typically, a long delay between the start of the study and the availability of the results. As a result concerns may be out of date by the time the key results are published.
4. The attrition of the sample during the study increases with the duration of the study as well as the likelihood of community resistance. Furthermore, the typical characteristics of drop-outs in longitudinal research are also the typical

characteristics of problem gamblers: male, single, minority group status, and substance use (Claus et al., 2002; Collins et al, 2000; Morrison et al, 1997). Attrition can be reduced through financial incentives, having a comprehensive list of tracking contacts, interviewer persistence including the use of unrestricted call backs, ongoing subject contact/engagement, emphasizing the importance of subject's contribution to the study, expressing appreciation and having flexible survey collection methods (Boots-Miller et al, 1998; Collins et al, 2000; Cotter et al, 2002; Jones et al, 2000; Morrison et al, 1997; Salyer et al, 1997).

5. Repeated assessment of subjects may influence the behavioral reports. For example, respondents may learn at the first assessment that more admission of problem behavior prolongs the interview, resulting in fewer admissions in subsequent assessments (Loeber & Farrington, 1995).
6. Maintaining and funding personnel across such a long time span may become a problem.

The Proposed Design: the “longitudinal multiple cohort” option

A number of considerations suggest a “longitudinal multiple cohort” design as the best option:

1. Following several different age cohorts simultaneously (‘multiple cohort strategy’) has several advantages (Farrington, 1991; Bell 1953). The period of funding is shorter and results can be produced more quickly with less concern about out of date theories, instruments or policy concerns. In addition, problems of ensuring continuity in the research organization are less. The shorter follow-up period reduces the problems of cumulative effects of testing or cumulative attrition. The follow-up of several cohorts (rather than one) may increase confidence in the generalizability of the results. Finally, the longitudinal multiple cohort design has the potential to study aging effects independently of period and cohort effects but only if there is substantial overlap between the follow-up ages of different cohorts.

One limitation that should be noted is that the tracking of within-individual developmental sequences as well as continuity and prediction is only possible within shorter time periods. Part of this limitation might be overcome by asking retrospective questions: “have you ever...?” followed by “at what age did you first...?”. Retrospective data covering the inter-cohort intervals may also be used in linking up the cohorts.

2. *A “real time” prospective study:* among the different longitudinal strategies, the “real time” strategy in which individuals selected and studied at a particular time and reexamined at subsequent occasions after certain time intervals is considered superior to the alternatives, though still liable to sample attrition. The other less desirable longitudinal alternatives are the “catch-up” or follow-up study using pre-existing records and an individual reassessment after a long time interval as well as the “follow-back” or “case control” type of designs that identify a current sample of known cases and then rely on retrospective memory of events leading up to development of the problem (Robins, 1980).
3. *Sampling size and Selection:* as the proposed cohort project wishes to examine the gamut of gambling behaviors despite the relatively low prevalence of gambling problems, it is proposed that each cohort consist both of a sample from the normal, representative population and a sample from a selected, higher risk sample. The size of the sample would depend on the variables selected. One limitation is that the high-risk sample might be a distortion of the population if not carefully selected (Mednick et al, 1981).
4. *Identification of mediating and moderating factors:* Longitudinal data allow us to determine not only whether one variable is associated with another variable but whether it precedes the other in time, a necessary property if a causal relationship is to be demonstrated. There are of course threats to internal validity, resulting from changes in other independent variables during that same period of time, maturation, and methodological factors such as testing, instrumentation and selection (Loeber &

Farrington, 1994). Another research thrust may be related to “how much” rather than “who or when”. This may be particularly important as we examine the impact of expanding gambling opportunities. Care must also be exercised if subjects have already had prolonged risk exposure at point of entry as the resistant ones may be already systematically different – the dose response relationship must be dimensionalized (Rutter, 1994). The directionality of prediction and association must also be determined. For example, child behavior as an outcome of parent behavior and vice versa (Wiersen & Frehand, 1994).

5. *Comorbidity and duration of study*: critical pieces of information need to be known about which comorbid or associated conditions often precede, co-occur with or follow the targeted disorder. As well, how do the comorbid conditions tend to influence the course and outcome of the targeted behavior/disorder? The duration and course of the target behavior/disorder should determine the duration of the longitudinal study (Loeber & Farrington, 1995).
6. *The need for study of the progression across the lifecycle*: a recurrent theme is the need to investigate what types of behavior act as stepping stones to other types, what are the most important protective factors and what are the most promising presentation/intervention strategies and at what developmental stage (Loeber & Farrington, 1995). There is very little such existing research, making our study across the life cycle potentially very rewarding.
7. *Inclusion or exclusion of experimental prevention or treatment interventions*: a planning decision is whether to execute the study as a naturalistic follow-up without interventions or whether to include experimental prevention or treatment interventions within a classic randomized clinical trial. It is understood that subjects in naturalistic studies will often participate in treatment or intervention programs initiated by outside agencies and data about these interventions must be taken into account (Loeber & Farrington, 1994; 1995). Our study will merely record these interventions.

8. *Assessment and definition of behaviors/disorders across the ages:* a major problem in a lifecycle longitudinal study is the lack of standardized assessment procedures and the uncertainty of age specific operational definitions of syndromes. Instead of treating diagnostic terms as fixed and tangible, it may be better to identify a common set of phenomena empirically and use longitudinal data for validation (Verhulst & Koot, 1991). This is of particular importance in a study of gambling behaviors particularly among adolescents and seniors.

Another issue is the common risk factors identified - particularly during childhood and adolescence - for a range of “deviant” behaviors encompassing legal troubles, sexually risky behavior, and teenage pregnancy and substance abuse. It is anticipated that the “usual suspects” will be identified as risk factors for gambling behavior. It will be important to identify the discriminating variables enhancing the risk of gambling behavior.

9. *Measuring aspects of gambling behaviors:* alcohol and gambling-related behaviors show many commonalities and raise similar methodological quandaries. Sher and Wood (1997) have recently reviewed specific issues raised in their research on alcohol-related behavior that could be applied to gambling, as discussed in Winters’ et al. prospective study (2002).
10. *Measurement of behavior:* Alcohol-related behaviors like gambling refer to a range of phenomena encompassing alcohol use (i.e., frequency of consumption, typical quantity consumed, frequency of heavy consumption), negative alcohol consequences and dependence symptomatology. Researchers need to specify the nature of their findings.
11. *Temporal reference for reporting behavior:* The past 90 days and the past year will capture more typical consumption patterns but accuracy is likely to deteriorate the longer the reporting interval. Sher and Wood recommend taking the mean of both

shorter term (i.e., the past 30 days) and longer term (i.e., past year) measure in the hope of a trade-off between precision and typicality. The fixed format of standardized questionnaires often imposes a pattern of drinking on a participant who does not adequately reflect the structure of his or her typical drinking. The instrument should capture the fundamental nature of the variables of interest.

12. *Issues of survey administration:* The science of assessing sensitive behaviors such as gambling is a complex undertaking. How the information is collected will influence subject response rates, subject retention, and the validity of self-report. The initial willingness to participate will be influenced by the inconvenience involved. A lengthy face-to-face interview will result in lower response rates than short interviews and administration by telephone. On the other hand, a short interview will collect less information than a longer interview and telephone interviewing does not allow for some types of psychometric testing (e.g., intelligence).

Another advantage of face-to-face interviewing is that it may enhance subject engagement, which is an important factor in reducing subsequent attrition (e.g., Boots-Miller et al., 1998). The trade off here is that greater engagement may result in greater biasing of self-report due to social desirability. Participants' responses to questions are often shaped by their perception of how positively or negatively others (particularly the interviewer) will evaluate their behavior (Del Boca & Noll, 2000). Although the "social desirability bias" is present in all social scientific research, it can be minimized with self-administered (as opposed to researcher administered) data collection techniques. Many studies pertaining to sensitive issues report higher response rates and more accurate responses using this method of data collection (e.g., Aquilino, 1997; McAllister and Makkai, 1991; Schaeffer, 2000; Supple et al, 1999; Tourangeau and Smith, 1996; van der Zouwen and de Leeuw, 1990). Computerized self-assessment often produces some of the most valid results among adolescents (Supple et al, 1999).

Research Design Details

1. A five-year prospective study capturing three age groups, adolescents, adults and seniors, of both genders is proposed. A multiple cohort longitudinal design is recommended. From the literature review and epidemiological surveys in the gambling literature conducted by AGRI in the year 2000 (el-Guebaly & Hodgins, 2000), the critical ages selected are:

- 13-15 year olds: This group presumably will be experiencing an initiation to gambling interwoven with developmental variables. This age group also allows for use of adolescent normed instruments for the 5-year duration.
- 18-20 year olds: This group is recognized epidemiologically as high-risk for frequent gambling. **In Alberta, the legal age for most forms of gambling is 18.**
- 23-25 year olds: This group must now address adult family, job responsibilities as well as leisure activities
- 43-45 year olds: This group in mid-adulthood has addressed several of life's tasks and as parents must now educate the next generation as to responsible leisure activities
- 63-65 year olds: This group, as it prepares for and experiences retirement, is particularly understudied. Opinions differ as to the impact of a changing gambling culture on this age group

From the above, it is possible that a **5-year “real-time” strategy** will allow a seamless assessment from age 13 to age 30 (the normative years in leisure activity) as well as comparisons with mid-adult and senior groups. Unfortunately, period and age effects will continue to be confounded unless the study is extended further in the future (something that could easily be done with additional funding).

2. Sample Size and Selection Criteria

In this type of study in which a large range of variables are assessed, the sample size needs to be as large as practical given the finances available. A variety of research questions will be addressed over the course of the study, each with

different sample size requirements. However, the primary dependent variables of interest are gambling behaviors and gambling disorders. Gambling behaviors are frequent in the general population with more than 82% of adults gambling at least occasionally (Smith & Wynne, 2002). The prevalence of gambling disorders is much lower, however. In the most recent Alberta random digit dialing survey, which used the Canadian Problem Gambling Index, 9.8% of adults scored in the low range, 3.9% in the moderate range and 1.3% in the severe range of problems (Smith & Wynne, 2002). In a meta-analysis of North American surveys, the rate of moderate disorders was estimated to be 2.5% and the rate of severe disorders was 1.5% (Shaffer & Hall, 2001). Clearly, it is not possible to study a large enough sample of the general population to ensure a reasonable incidence and prevalence of gambling disorders. Based upon prior research designs (e.g., Loeber et al, 1989) we will use two sampling strategies.

Random digit dialing will be used to recruit 1000 people for a 'general population sample'. There will be 200 people in each of the five age cohorts, with an equal gender representation in each cohort. The general population sample will provide information on both gambling expenditure and gambling frequency, which will be used to establish age and gender specific cutoffs for the 70th percentile in each. Once these cutoff points have been established, a second wave of RDD sampling will occur to recruit 1000 'high risk' gamblers who are at the 70th percentile or above in either category (again, stratified by age and gender). The intent of the 'high risk' sample is to increase the yield of individuals who are experiencing or likely to develop gambling problems during the course of the study.

Inclusion Criteria

- Age falls within one of the five cohorts
- Willing to provide informed consent to study requirements (e.g., followed for five years, provision of contact information)
- In the case of adolescents, consent of custodial legal guardian
- Resident of geographic target area (main address)

- Resident of Alberta for a minimum of three months (to ensure Alberta Health record)

Exclusion Criteria

- Evidence of uncontrolled psychosis
- Inability to read English at the grade 5 level (assessed by Slosson Oral Reading Test)

Both gambling frequency and gambling expenditure are strong predictors of high risk gambling behavior (Smith & Wynne, 2000); however, there are methodological limitations associated with each measure. For instance, gambling frequency indicates high risk behavior when applied to continuous gambling formats such as VLT, slot machine and casino play, but less so when utilized with non-continuous gambling formats such as lottery, raffle and pull-tickets. Also, there is a small but important portion of the gambling population that gambles frequently and heavily but may not be at high-risk group for developing gambling problems (e.g. professionals attempting to exploit a skill or knowledge advantage in formats such as poker, pool, sports and racetrack betting) (Rosecrance, 1985).

Several researchers have questioned the accuracy and consistency of self-reported gambling expenditure data. The first is the matter of interpreting the question: Is it the total amount bet in a given session or the difference between the initial amount risked and the residual at the end of the session (Blaszczynski, Dumalo & Lange, 1997). The second is that even if the question is interpreted consistently, survey respondents may not precisely recall their gambling expenditures (Williams & Wood, 2004). Third, comparisons between estimated gambling expenditures and provincial/state gambling revenues show that survey respondents over-state expenditures on lottery games, bingo, casino table games and pari-mutuel wagering and underestimate expenditures on electronic gambling machines (Volberg, Gerstein, Christiansen & Baldrige, 2001). Forth, question wording can bias the response (Williams & Wood, 2004). Fifth, some forms of gambling are seasonal

(e.g. horse racing), as is gambling participation for many respondents (e.g. they play more during the winter than in the summer) (Williams & Wood, 2004). Lastly, there is a suggestion that problem gamblers may think about and report their gambling expenditures differently than non-problem gamblers (Volberg, et. al., 2001).

Given these potential drawbacks we propose to combine monthly gambling frequency and expenditures as criteria for our high risk sample selection.

In addition to using both measures we expect to improve on previous studies using these indicators by adopting the recommendations of (Williams and Wood, 2004), which include; (1) accounting for the social desirability of different forms of gambling, (2) using sampling strategies that minimize the likelihood of false negatives and the under representation of problem gamblers, (3) incorporating measures of reliability and validity into the questionnaires, and (4) wording gambling expenditure questions so as to eliminate ambiguity and reduce the potential for misinterpretation.

3. Power calculation

To illustrate using gambling expenditure data, the cut-offs were estimated from existing general population data (N= 1804) as follows: For males, the 70th percentile of annual expenditure is \$480. and for females it is \$240 (Smith and Wynne, 2002). At these cutoffs, of the non-problem gamblers, 80% scored below; of at risk gamblers, 30% scored below; of moderate risk gamblers 22% scored below; and of the severe risk 7% scored below. A sample size of 200 high frequency gamblers will be expected to contain approximately 118 at risk, 57 moderate risk and 22 problem gamblers in each age cohort.

The general population sample will provide 20 low risk, 8 moderate risk and 3 problem gamblers in each age cohort. These figures represent past year point prevalence – no information on incidence in the general population is available. However, these estimates suggest that a sample of 400 – 200 high risk and 200

general population – per age group will provide sufficient power for the analyses of interest. Attention was also paid to the fact that the single age group of adolescents will require specifically normed instruments. The total sample will thus be 2000 including both genders.

4. Representative location of the Sample

To minimize the costs associated with personal interviews, a geographic sampling plan has been developed. Approximately 1/3 of the sample will be allocated to each of the City of Edmonton and the City of Calgary. These large urban areas account for about 65% of the Alberta population. The remaining third of the sample will be allocated to Lethbridge and the areas surrounding Lethbridge, and to Grande Prairie and the areas surrounding it; with the major proportion going to the Lethbridge area. Within a reasonable traveling distance of Lethbridge are a number of smaller centres that vary substantially on dimensions of VLT availability, prevailing community norms, population structure, and major industries (Smith and Wynne, 2004). A careful implementation of the sampling frame (such that Lethbridge urban residents are somewhat less likely to be chosen in the selection procedure) allows the study to examine the potential effects on gambling behavior of these community differences.

A similar sampling strategy for Grande Prairie and surrounding centres will also allow the study to consider potential north to south differences (Appendix 2). The exact proportions chosen for each geographic sample will depend upon an analysis of existing demographic data, and the availability of telephone lists restricted to small geographic areas for inclusion into the sampling frame.

5. Sampling Protocol

Once all communities are chosen, the RDD banks associated with these communities will be assembled. Weights will be assigned to the probability of choosing a phone number from this assembled bank in such a manner as to ensure

that 35% of the sample will be drawn from the chosen rural communities (the weights for the rural communities will also reflect their relative populations). The sampling for both normal and high risk populations in each age range will then proceed by random draw from the weighted telephone lists and quotas filled according to age and risk status as set out above. This procedure allows that the relative proportions of individuals by community in each age and risk group reflects real differences in age and gambling frequency distributions between communities.

6. Attrition rate

An initial refusal rate through telephone contact of approximately 25% is anticipated (Population Health Lab data). For the recruited sample, the attrition rate is likely to be higher for the high frequency versus general population sample. Our research group has achieved a 78% follow rate for over 24 months for a group of pathological gamblers (Hodgins et al, In Press) and an 84% three-year follow-up rate for a group of alcoholics (Hodgins et al, 1999). We conservatively estimate an attrition rate of 25% although we expect that our tracking procedures will lead to better results. Based upon the studies described in Appendix 1, we estimate the attrition rate in the general population sample to be 10-15%. To promote follow-up, the case-tracking measures previously listed, i.e., financial incentive (\$50 for initial interview, \$30 for year 2, 3 & 4 and \$75 for the final interview), tracking collaterals, interviewer persistence, ongoing subject contact/engagement, expression of appreciation and flexible data collection methods are all being considered.

7. Recording of preventive or treatment interventions

Implementing experimental interventions is considered beyond the scope of this study. Study subjects will be allowed to participate in programs offered to them in a naturalistic fashion and their involvement will be recorded.

8. Assessment and definition of behaviors across the ages

Despite the range of screening instruments available, the lack of consensus on a particular measure for a specific age group is a challenge. Based on the

investigators' experience (Smith & Wynne, 2002) the Canadian Problem Gambling Index (CPGI) will form the core instrument for the adult cohort. Modifications for adolescent and senior age groups will be introduced. Indeed, an anticipated product of this study is to identify relevant variables to inform screening instruments for gambling behavior across the life-cycle.

9. The spectrum of gambling behaviors

Measurement of the gambling behaviors as well as the temporal reference for reporting behavior will be informed by prior gambling prospective studies as well as Sher and Wood's review of the methodological issues in the prospective study of alcohol-related behaviors (1997).

10. Recruitment and survey administration

Initial recruitment will be through telephone random digit dialing. The initial interview will be in person, although certain parts of the assessment may be self-administered. The length of the initial interview will be limited to a maximum of 3 hours. Data collection in subsequent years will encourage face-to-face meetings, but may also allow for alternate methods to minimize inconvenience and attrition (e.g., telephone interviewing, mail-out surveys, on-line completion of surveys). The length of the subsequent surveys is estimated to be approximately 2 hours.

C. CONCEPTUAL FRAMEWORK TO BE TESTED

Recent reviews of causal theories and related investigation among adolescents (Winters & Anderson, 2002) and seniors (Hope & Havir, 2002) further caution against embracing a single conceptual theory. The gambling field is at a stage where a broad net strategy across causal domains remains warranted. Prior reviews of concurrent comorbidities also support the proposed broad net strategy across the life-cycle (Crockford & el-Guebaly, 1998; National Research Council, 1999). Our general perspective is inductivist rather than theoretical conductivist. A broad causal conceptual model is outlined in this section.

Before unfolding in detail the various parts of our conceptual framework, it is important to justify our stance on gambling as a potentially addictive behavior. Debate persists in the academic literature about whether or not problem gambling behavior can be properly classified in terms of addiction. While there exists a general consensus about the addictive qualities of alcohol, drugs, and other psychoactive substances, there is a more fractured consensus about the addictive qualities of potentially problematic behaviors such as gambling. Some researchers, for example, argue that the concept of addiction involves physiological processes that do not appear to be present in cases of excessive or problem gambling (Walker, 1989). Countering such claims, however, recent research suggests that certain problem gamblers do indeed experience physiological processes that normally have been associated with substance addictions (Moreyra et al, 2002).

Further advocating the appropriateness of an addiction model for certain forms of problem gambling, other researchers argue that the conceptual parameters of addiction have, in the past, been overly rigid and restrictive. These researchers argue instead for a less stringent definition of addiction (and problem gambling) that focuses on the social aspects of addiction, in addition to the biological and psychological ones (Shaffer and Kidman, 2003). Viewing addiction as a multi-dimensional concept, over the past two

decades a growing number of gambling researchers concur that some forms of problem gambling are properly viewed as addiction (Clarke, 2003; Cardone et al, 1997; Dickerson, 2003; Orford et al, 1996; Petry, 2003).

Informed by this body of research literature, we too work from the assumption that some forms of problem gambling are addictive in nature. More specifically, we work from the informed assumption that some problem gamblers meet the criteria for 'pathological gambling. Pathological gambling typically gets defined as problem gambling associated with both a loss of control (e.g., gambled more than intended; chasing losses; unsuccessful attempts to control or limit gambling activity) and evidence of dependence (e.g., withdrawal; craving; irritability when cutting back) (APA, 1994).

We turn now to our conceptual framework. Aasved (2002) recently listed some 61 theories gleaned from the literature that attempt to explain various aspects of gambling behavior. These theories are compiled under the headings of "Psychodynamic; Behavioral Psychological; Social Science; Statistically-based; Medical or Disease; Multicausal". Focussing on pathological gambling, Blaszczynski and Nower (2002) concluded that no single conceptual theoretical model adequately accounts for the multiple biological, psychological and ecological variables contributing to the development of pathological gambling. Three distinct pathways to gambling impairment were hypothesized resulting in the following sub-groups, i.e., behaviorally conditioned problem gamblers, emotionally vulnerable problem gamblers and antisocial, impulsivist problem gamblers.

The conceptual framework that guides this study is based upon the biopsychosocial developmental paradigm (Windle & Davies, 1999). This paradigm emphasizes the role of multiple factors, from different levels of analysis (e.g., biological, cognitive, social, cultural), in the determination of gambling or gambling disorders.

The framework is presented in Figure 1. Each block represents a domain that has a previously postulated association with gambling or gambling disorders or with

substance use or disorders. These domains represent either risk or protective factors. In some instances there is some, typically limited, empirical support for the involvement of one or more of the sub-factors within the block with gambling. The goal is to establish a broadly based model to act as the foundation for specific hypothesis building and testing. Substance abuse is included because our understanding of risk and protective factors in substance use disorders is much further advanced than it is for gambling disorders and it is assumed that the two disorders share common risk factors (Winters & Anderson, 2000).

The Gambling Involvement and Gambling Disorders blocks (with dark black borders) represent the major dependent variables of interest in the study. Gambling disorders are conceptualized in three related ways, the formal psychiatric conceptualization of pathological gambling, a broader harm-based definition of problem gambling, and through a dimension of impaired control (Dickerson & Baron, 2000).

The Family History block (see Figure 1 left hand side) includes heritable risks, as estimated by family history variables (Comings, 1998).

The next column of blocks includes Biological Risks, Temperament/Personality Risks, Cognitive Factors, Family Environment and Extra-family Environment. The biological risks include gender, neuropsychological and neurotransmitter functioning. There is evidence for impaired orbitofrontal lobe function in pathological gamblers (Bechara, Damasio, Damasio & Lee, 1999; Cavedini, D'Annuncci, Ubbaldi et al., 2001) and the association between dopamine, noradrenaline, monoamineoxidase and serotonin with its related genetic polymorphism has received some study with mixed results (Chambers & Potenza, 2003).

The Temperament/Personality domain is included because of the clear association between these factors and substance abuse disorders, which are highly comorbid with gambling disorders (e.g., Sher, Trull, Bartholow & Vieth, 1999; Roy, DeJong & Linnoila, 1989; McCormick, 1993; Barnes & Parwani, 1987). Impulsivity, in particular, has been consistently identified as linked. Similarly, coping skills are included within the

Cognitive domain as potential risk or protective factors because of research in substance abuse disorder. Erroneous beliefs are considered central in the etiology of gambling disorders (Toneatto, 2002).

In the domain of family environment, poor family functioning, such as family conflict is associated with greater and earlier substance use (Sher et al, 1999). In addition, specific parenting practices, such as inconsistent discipline, and inadequate supervision, predict many adolescent antisocial practices (Barnes et al, 1999; Barnes et al, 1994; Chambers et al, 2001; Stewart et al, 2002; Wright et al, 2000), and so it is reasonable to expect that parenting will similarly be predictive of both responsible and pathological gambling. Similarly, abuse experiences, including sexual and physical violence, have been linked to a range of mental health disorders (Windle & Davies, 1999).

While family environment likely has an important impact on problematic behaviors and addictions, it is crucial to recognize that the family is situated in a broader social context that necessarily affects it. Moreover, it is important to realize that, outside of the family environment, the individual's behavior is impacted by a multitude of extra-familial social factors. For the purposes of this study, the "extra-familial" domain includes networks, relationships, and other social influences, from outside of the family context, that potentially impact the individual's gambling behavior.

As evidence of the impact of extra-familial social factors upon gambling behavior, it is a long-documented fact that peer and friendship networks have a strong effect on all forms of behavior, both pro-social and antisocial (Cattarello, 2000; Garnier & Stein, 2002). More importantly, recent research on adolescent gambling confirms the influence of peers' gambling behavior (Gupta & Deverensky, 2000). Other extra-familial influences, such as the individual's level and quality of religious/cultural identification, are also predictors of pro and antisocial behaviors, with degree and type of religious and cultural identification having a significant effect on behavior and social interaction (Baier & Wright, 2001; Hawkins, 1995; Johnson et al, 2001; Kirkpatrick, 1993). Similarly, the

individual's level and type of education have an impact on their propensity to engage in socially responsible or social irresponsible behaviors (Maloney and Kelley, 2000; Wagner & Zick, 1995).

While each of these factors impact gambling behavior in respectively distinct ways, they also work together to bestow upon the individual a certain level of cultural capital. Cultural capital refers to a set of *social assets* or *social skills*, which include competencies in the dominant values, norms, beliefs, traditions, and languages of a society (Bourdieu & Passeron, 1990). The individual with high levels of cultural capital will possess the requisite *social skills* to successfully negotiate the complexities and problems of the social contexts in which they find themselves (Kennedy et al, 1998; Rosenfeld et al, 2001). Thus, insofar as a strong social skill-set enables people to make responsible decisions with respect to their gambling behavior, we expect that social skills will be predictive of both responsible and pathological gambling.

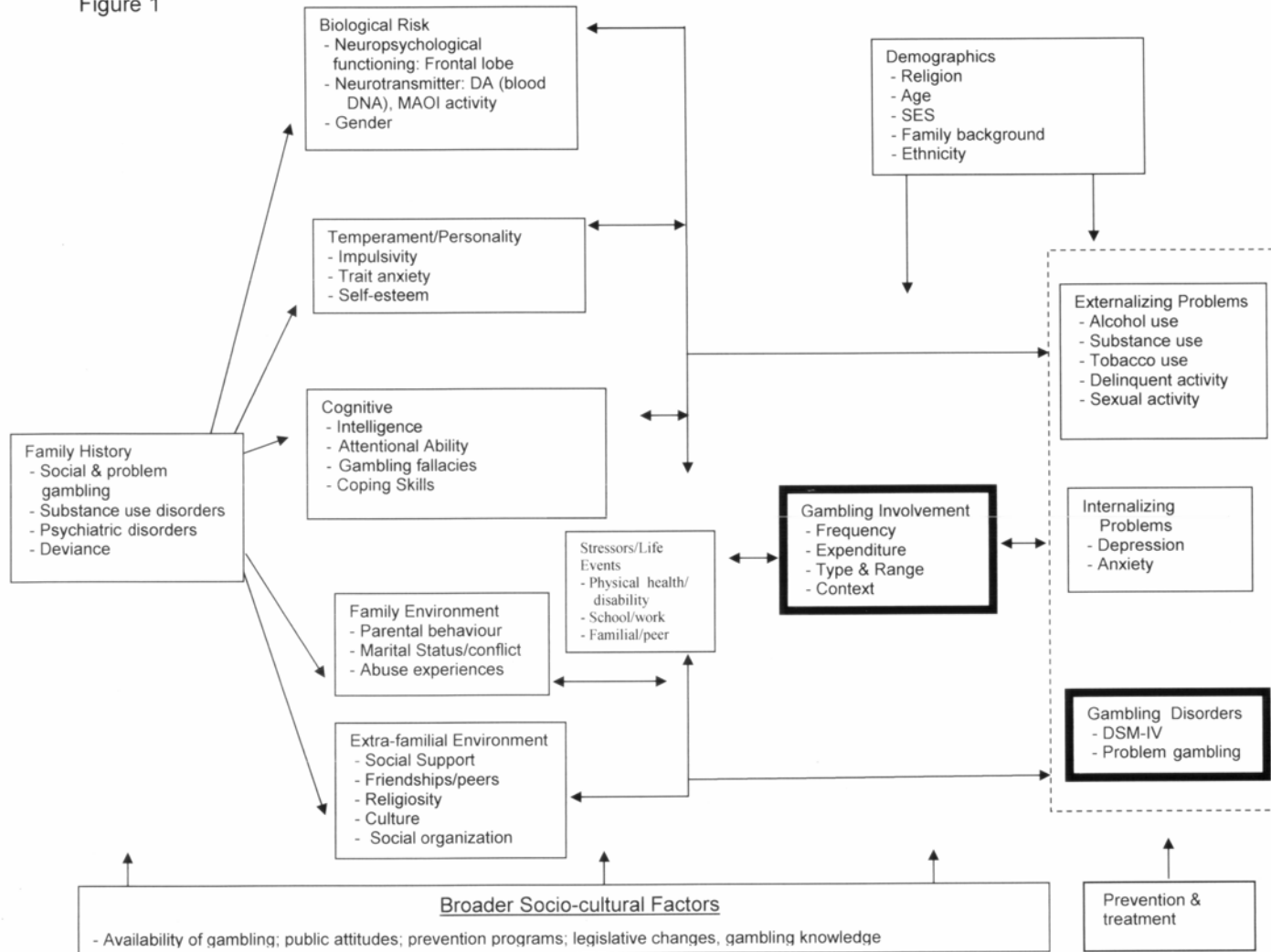
Like all human behavior, gambling occurs in shifting social and political context. Thus, the individual stressors (represented in other blocks in figure 1), as well as all other variables predictive of responsible or pathological gambling, are influenced at a broader level by changing social and political forces. Thus, we expect that the individuals' propensity for either responsible or pathological gambling will be impacted by such factors as the legislation of gambling, the availability of gambling opportunities, public knowledge and attitudes about gambling, and exposure to problem gambling awareness and prevention initiatives.

The column on the far right includes - in addition to gambling disorders - other mental health disorders that are frequently comorbid with gambling disorders (Crockford & el-Guebaly, 1998). Treatment influences are also reflected in this column.

In summary, this biopsychosocial developmental framework serves to identify the major domains of risk factors, and to highlight the interactive nature of these factors. The current investigation, using different age cohorts, will also allow the association of these

variables to be examined developmentally. The timing of different influences (e.g., first exposure to gambling opportunities, first use of alcohol, etc.) may produce different life course trajectories for different groups of individuals.

Figure 1



D. SELECTION OF INSTRUMENT(S) (Appendix 3)

A baseline 3 hour intake face-to-face interview, preceded by a 1 hour telephone interview is considered optimal. During the face-to-face interview, a mix of structured interview and self-administrated questionnaires will be administered, the latter particularly for sensitive information. Subsequent assessments may adopt a different format (mail-in, web-based, etc). Not all data have to be collected during each interview, allowing for some flexibility if contractual researchers wish to add specific questions at later intervals and across domains. The order of administration of the instruments will be counter-balanced. Instruments short-listed to cover the conceptual model fall under three categories.

The strategy for selection of instruments was according to the following parameters:

- a. Examination of the most reliable and valid instrument available within the area being assessed from Fig. 1.
- b. Examination of existing omnibus instruments for comparison purposes
- c. The instruments should be applicable to as many age cohorts as possible (in reality few adolescent instruments are applicable to adult cohorts and vice versa).
- d. Assembly of the final battery to maximize measurement ability, time of administration and scope of coverage
- e. Some instrumentation development was required.

Appendix 4 contains a complete listing of the instruments selected for this study, their psychometric properties and the aspects of the conceptual framework that they relate to.

GAMBLING AND COMORBIDITY FOCUSED INSTRUMENTS

In addition to getting an assessment of lifetime gambling involvement in the initial interview, there are at least five areas of gambling that need to be assessed. The first is *Attitude toward gambling*. This shall be measured through a combination of survey

questionnaire items. A series of questions regarding the participants impressions of how hard versus harmless various forms of gambling are has been extracted from a survey conducted by the Alberta Gaming Liquor Commission in 1995, 2000 and 2003. Further questions on Albertans' attitudes towards gambling have been taken from various Canada West Foundation surveys. The data collected by the AGLC and Canada West Foundation will give us a baseline against which to compare our cohorts. The final two included questions compose a 2-item scale that has been developed and field tested by R. Williams on 1300 adolescents and 600 university students. It is a measure of people's belief about the morality of gambling and the harm versus benefits of gambling. It has very good test-retest reliability as well as concurrent and predictive validity.

Knowledge of gambling and problem gambling, i.e., one of the instruments considered is the **Gambling Knowledge Scale**, a 10-item scale, developed and field tested by R. Williams on 1300 adolescents. It is a measure of whether people are aware of the legalities of gambling, the different forms of gambling, the prevalence of problem gambling, risk factors for developing problem gambling, where to get help for problem gambling, etc. For adolescents it has very good test-retest reliability, internal consistency, as well as concurrent and predictive validity. It has not yet been tested on adult populations.

Gambling fallacies will be measured by combining the **Gambling Fallacies Scale** developed by R. Williams and the **Gambling Cognitions Inventory** developed by A. Holub. The Williams instrument is a 10-item scale developed and field tested on 1300 adolescents and 600 university students. It measures awareness of and resistance to common gambling fallacies. It has very good test-retest reliability, internal consistency, as well as concurrent and predictive validity. The Holub scale has 4 subscales, probability errors, magical thinking/luck, information processing biases, and illusion of control. Alphas in a university sample were .71, .67, .95 and .87 respectively. AGRI is funding a larger validation study and data collection is underway.

Gambling behavior is to be measured by questions from the **Canadian Problem Gambling Index (CPGI)** (Ferris & Wynne, 2001) that ask about the types of gambling engaged in, the frequency of involvement, and the amount of expenditure on each type.

Problem gambling will also be jointly assessed with the 9-item problem gambling scale from the **Canadian Problem Gambling Index** as well as the **Fisher DSM-IV-J-MR** for adolescents.

The CPGI resulted from a three-year (1997-2000) national research project called "Measuring Problem Gambling in Canada." The aim of the project was to develop an instrument that accurately identifies and classifies non-problem, at-risk, and problem gamblers in the general population and the Canadian Problem Gambling Index (CPGI) was the end product of this project. Previously used instruments in general population surveys such as the SOGS and DSM IV manual diagnostic criteria for "pathological gambling," are now considered to be less sophisticated than the CPGI because they have been validated only on clinical populations. The CPGI is thought to be a more precise instrument for measuring problem gambling behavior among non-clinical populations.

In developing the CPGI, theories and models used to explain problem gambling were inspected and the various measures used to identify problem gamblers and those at risk for becoming problem gamblers reviewed. Ten different problem gambling measures, not counting derivatives, were detected in the literature. The SOGS was used most extensively; indeed, the SOGS was used in two Alberta problem gambling prevalence surveys (Wynne, Smith & Volberg, 1994; Wynne Resources, 1998).

In the process of creating the CPGI, the research team critically analyzed existing instruments, and examined the domains and variables that each purported to measure for the purpose of incorporating the best of these into the CPGI's first draft. This draft was scrutinized by an international panel of gambling-research experts, modified, and then pilot-tested with three groups [a random sample from the general population, regular

gamblers who responded to newspaper ads, and problem gamblers in treatment (N=50 per group)].

Following the pilot-test, the 31-item CPGI was tested in an Anglo/Franco national general population survey sample of 3,120 Canadian adults drawn from all provinces. To establish reliability, the CPGI was re-administered to a sample of 417 respondents from the initial survey. Finally, to further validate the classification accuracy of the CPGI, problem gambling treatment specialists conducted clinical interviews with 143 survey participants. As a result of these investigations, the CPGI is the first problem gambling behavior measurement tool to be rigorously tested prior to its use in community-based surveys. Moreover, it is the only problem gambling measurement tool to have established and published psychometric properties before its use in gambling research projects (Ferris & Wynne, 2001).

As indicated above, the CPGI was designed for the purpose of making a finer distinction between respondents who have gambling problems and those who do not, and between gamblers who are at a low or moderate risk for developing problems. Within the CPGI, nine items (Q8-17) comprise a sub-scale known as the Problem Gambling Severity Index (PGSI). The PGSI distinguishes four gambler sub-types, namely: non-problem, low risk, moderate risk, and problem. The non-problem group is further divided into gamblers and non-gamblers, as these types are known to display different characteristics.

The CPGI has now been used in problem gambling prevalence surveys conducted in Ontario, Saskatchewan, Alberta, British Columbia, in the state of Queensland in Australia and the Canadian Community Health Survey. It is designed to measure gambling behaviors in general populations but not clinical populations as yet (The Wager, 2004).

Because the CPGI has not been normed for adolescents, **Fisher DSM-IV-J-MR** will be the primary instrument for this cohort. This latter instrument consists of 12 items that assess nine of the ten diagnostic criteria for adult problem gambling (CPGI in adults; DSM-IV-MR-J in adolescents (Fisher, 2000)).

Finally, *Pathological gambling* will be measured in all cohorts by means of the Composite International Diagnostic Interview's gambling module, which uses the DSM-IV criteria for pathological gambling (**CIDI-DSM-IV**) (APA, 1994).

It is also anticipated that data collection techniques will also include the use of diaries in subsamples from the general population and high frequency gambling groups.

OTHER INSTRUMENTS

The **Personality Assessment Inventory (PAI)** is a self-report instrument with excellent reliability and validity. It comprehensively assesses all main areas of psychopathology, which is needed in order to ascertain which types of pathology are related to problem gambling.

The **Child Behaviour Checklist (CBC)** is the most widely used and best standardized broad-based assessment of adolescent psychopathology in existence. Again, a comprehensive instrument is needed so as not to pre-judge which pathologies are subsequently related to problem gambling.

The **Family Environment Scale (FES)** is also a comprehensive measure of family functioning that is widely used and recognized. It will allow us to determine which (if any) areas of family functioning are related to subsequent problem gambling or resiliency against problem gambling.

The **Neuroticism, Extroversion, Openness (NEO)-Personality Inventory** is a widely used measure that provides a comprehensive description of personality traits. It focuses on "normal" personality traits and is therefore, ideal for a general population survey. A short and long version exist, with the short version providing indicators of the five major traits and the long version providing, in addition, measures of a large number of sub-traits. We will use the short version for three of the major traits and the long

version for the remaining two traits, which are associated with additive behaviour involvement (extraversion and neuroticism).

The **Composite International Diagnostic Interview (CIDI)-SF** is the short form of the World Health Organization's structured interview assessment of psychopathology. The CIDI-SF indicates current and lifetime psychiatric disorders and has been used in the general population National Comorbidity Study in the United States.

SF-36 is a brief self-report measure of health status. It has been used widely with both medical patients and general population samples and it is useful to monitor changes over time.

Childhood Trauma Questionnaire provides a standardized self-report measure of prior childhood physical and sexual abuse. It has been used with gambling samples previously. The self completion format is associated with more accurate reporting in this sensitive area.

Wisconsin Card Sorting Test is a neuropsychological measure of "shift of set" and executive functioning. These abilities have been shown to be impaired in problem gamblers and related to impulsive style of responding.

The **Wechsler (WASI)** is nationally standardized, yields the three traditional Verbal, Performance, Full Scale IQ scores, and is linked to the Wechsler Intelligence Scale for Children and the Wechsler Adult Intelligence Scale.

The **Lazarus Ways of Coping** is one of the most widely used and validated measures for assessment of coping style in adults. It is thought that an escapist coping style may be related to the development of problem gambling.

Stressors are often precipitators for the development of addictions. The **Life Events Questionnaire** is a broad based measure of significant life events in the past year that will enable us to examine the relationship between life stressors and gambling behaviour.

Impulsivity is thought to be related to the engagement in risk-taking behaviour, including gambling. Impulsivity is a core feature of ADHD. Thus, we wish to examine the relationship between this clinical condition and the development of problem gambling using a widely used and validated instrument.

Regarding sociological (extra-familial) scales, the following are suggested:

Marital Satisfaction is to be measured using the **Kansas Marital Satisfaction scale**. This three item scale assesses marital satisfaction as well as, if not better than, other much longer scales in current use.

Religiosity is to be measured using the **Rohrbaugh – Jessor Religiosity Measure**. This eight item scale measures a range of dimensions of religiosity, and appears to be well suited for use in a multi-religious social landscape such as Canada.

The nature and quality of people's *social networks* will be assessed using the **Luben Social Network Scale**. The Luben Social Network Scale is a 10 item measure of social networks that is easy to score and takes only 5 - 10 minutes to complete. Thus far, the scale has been validated primarily among older populations, but should be easily adaptable to other age groups.

The degree and nature of neighborhood cohesion (*social organization*) experienced by participants will be assessed using the **Buckner Neighborhood Cohesion** scale. Neighborhood cohesion is a variable that encompasses both psychological sense of community and social interaction within a neighborhood (both of which should place normative constraints on the individual's behavior).

Social/ethnic identity will be assessed using the **Orthogonal Culture Scale** and the **York Ethnicity Scale**. The Orthogonal Culture Scale produces a separate cultural identification factor for each potentially relevant culture. The York is a 3 factor scale that measures social/ethnic identity in terms of in-group ties, centrality, and in-group affect.

In addition, consideration is being made to obtain a blood sample for genetic polymorphic analysis, however this matter will constitute a separate research proposal (Appendix 4).

E. DATA ANALYSIS

The scope of the study is sufficiently large that the resulting database will be a resource for many varying kinds of analyses by different researchers or research groups over the life-span of the database (which could be decades) (Jordan, 1980,1994; Toney et al, 1991, Collins & Horn, 1991; Loeber & Farrington, 1994; Randenbush, 2001).

Discussions of the analysis of complex databases are simplified by considering 'focal relationships' (Aneshensel, 2002). These are the fundamentally important relationships around which the project revolves. Here, these involve the relationships between gambling frequency and problem gambling and between these and a wide range of the potential determinants as organized and displayed in Fig. 1.

Analysis will:

- a) begin after the collection of the first year of data;
- b) consist initially of descriptive analysis and tabulations of cohort differences across variables collected in the initial interviews,
- c) involve exploratory investigations (e.g. exploratory factor analysis) of the domains identified in Fig. 1, and
- d) involve analyses of associations between gambling behaviors and disorders and the variables describing the domains identified in Fig. 1 (e.g. multiple regression)

It is recognized that the complex sampling framework will require that analysis include adjustments for stratification and clustering. The potential exists for the testing of complex Structural Equation Models (i.e. models combining one or more of the following: latent variables (e.g. as in factor analysis), modeling of variable associations (e.g. as in regression analyses), and the analysis of change. Individual analyses can be designed to answer particular questions that arise out of the framework discussed in figure 1. The particular methods that could be employed in such analyses would depend on the particular SEM chosen for test and include a wide array including: factor analysis, regression analysis, Multivariate Analysis of Variance, and/or a variety of

generalized linear models (depending upon the numeric properties of the variables chosen for the models). Examples of particular models that could be tested within the full project database include Blaszczynski and Nower's (2002) pathway model and models emphasizing the role of temperament and personality traits (Vitaro et al, 1996). Hierarchical Linear Modeling will also be employed. HLM is a method by which both individual and community level variables and their interaction can be included in the same model.

After the second and subsequent years of data have been collected, further rounds of analysis will be conducted. These will focus on:

- a) repeated measures analysis for variables describing gambling behaviors and disorders (e.g. Analyses of change scores, Repeated Measures Analysis of Variance, Analysis of Trend)
- b) lagged-cross panel analysis of cross-temporal relationships in gambling behaviors (frequency, expenditures, type) in the general population sample and on gambling disorders in the high risk sample- including analysis of predictors.

A number of the data collection techniques anticipated for use in the current study (e.g., diaries, open-ended responses to interview questions) will require initial qualitative analysis. These provide an opportunity to combine qualitative and complex quantitative analysis with the same study and potentially within the same analysis.

It is anticipated that data analyses will be primarily conducted directly by members of the research team in close consultation with each other and with the biostatistician.

Five years post-collection, the research data set will be archived at a secure location, such as the AGRI, University of Alberta Population Lab (and/or similar facilities at U of C and U of L) for potential use by researchers outside the original group. Only qualified researchers that have applied through a formal process will be granted access to the data.

F. ETHICAL CONSIDERATIONS

Ethical review will be conducted by the host universities – The University of Alberta, The University of Calgary and The University of Lethbridge. At all times, the rights on the participants will be protected in accordance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. (See Appendix 5 for examples of the adolescent and adult consent letters.)

Adult participants: Participants will provide informed consent to participate in a series of face-to-face and telephone interviews over a period of five years (schedule will be determined in advance of the launch of the study) that includes information about personal and social functioning as well as health information retrieved from personal identifier (Alberta Health). Participants may refuse to answer questions at any time during the study and can withdraw from the study at any time for any reason. The interview results will be confidential and will not be made public in any form in which an individual could be personally identified as a participant. Data transfer between universities will be done in a secure manner, without identifying information for participants. The information will be kept at all times in a secure place to which only the researchers have access. Participants will be aware that confidentiality will be maintained unless the individual reveals that he or she is an immediate danger to him or herself. In such cases, protection will be provided which may require not maintaining confidentiality. A specific set of procedures and training will be available for all project personnel.

There are no clear risks to participants. The interview will cover personal information that may be upsetting to some individuals. All participants will be provided with information about available support services (e.g., crisis lines).

Participants will be made aware that they may not benefit personally from their involvement in the project. Travel expenses and compensation depending on the

interview will be provided (\$50 for initial interview, \$30 for each subsequent interview and \$75 for the final interview) but no other payments will be made.

Participants will be asked to provide the names of up to three people who are likely to know where they are if we are unable to contact them. Other information (e.g., SIN, email addresses, etc.) will also be collected, strictly for the purposes of tracking participants. Participants will also be asked to provide the names of family members or friends to act as corroborators of reports of gambling involvement. These individuals will be asked to provide separate informed consent for their involvement. These collaterals will be informed that the participant has volunteered for a study with the associated University and we wish to locate them. No other information will be provided to protect privacy. Aside from providing a tracking aid, the use of collaterals will be most useful in encouraging truthfulness given the opportunity for verification by others. This is particularly useful in collecting information on sensitive subjects. Only 10-20% of collaterals will be actually briefly interviewed. A higher proportion of collaterals (30-40%) will be interviewed in the adolescent sample.

Participants will be aware that portions of the interview may be audio-recorded for review by other personnel to ensure accuracy on the part of the interviewers. Audio tapes will be erased after the accuracy check is complete.

Consent for further follow-up after the five-year period will also be requested at the end of the study. Participants will also be asked to provide their Alberta Health Care number and permission to access their health records in order to track their use of health resources.

The above information will be discussed with potential participants by telephone. At the first face-to-face meeting, the information will be reviewed and written informed consent obtained. An example of the letter of consent to be used is provided in Appendix 5.

Adolescent participants (age 17 and younger): The above information will be reviewed with both the adolescent participant and a legal guardian. Written informed consent will be obtained from both. An example of the letter of consent to be used is provided in Appendix 5.

The possibility of further follow-up beyond the 5 years will be raised and permission sought. The ongoing existence of the project database will be discussed.

G. ESTIMATED BUDGET

Testing of Instruments and procedures will be further refined in the pilot phase of the project. The cost over 5 years is estimated at \$1.86m with approximately \$665,000 for the first year and the balance distributed over the next 4 years (see Appendix 6).

Due to the large size and unique nature of the sample population, the sampling process, including the frequency, length, interview format, and location is complex. This factor, together with the costs of participant compensation have a significant impact on the budgetary requirements. The total amount is comparable to similar longitudinal projects which have recently been funded by CIHR. Much of the cost is for data collection and expertise in the project's oversight to ensure its integrity and scientific merit. Staff are required to contact and assess the subjects, to clean and process the data, and to carry out analyses. Much consideration was given to whether subjects should be compensated. It was determined that modest compensation for the time required to participate would be both fair to the subjects and assist with ensuring continuing participation. The amounts budgeted are: \$75 initial compensation for the telephone and face-to-face interviews, \$30 for each of the subsequent years, and a \$75 final compensation for the last year. It is recognized, as well, that nurturing participants on a continuing basis is important to minimize attrition. With this aim in mind, it was decided that a calendar would serve as both a useful reminder of the pending commitment as well as promoting the study. The production costs for a calendar have only been included for Year 2 of the budget with a view to soliciting outside sponsorship if subsequent editions are determined to be advisable.

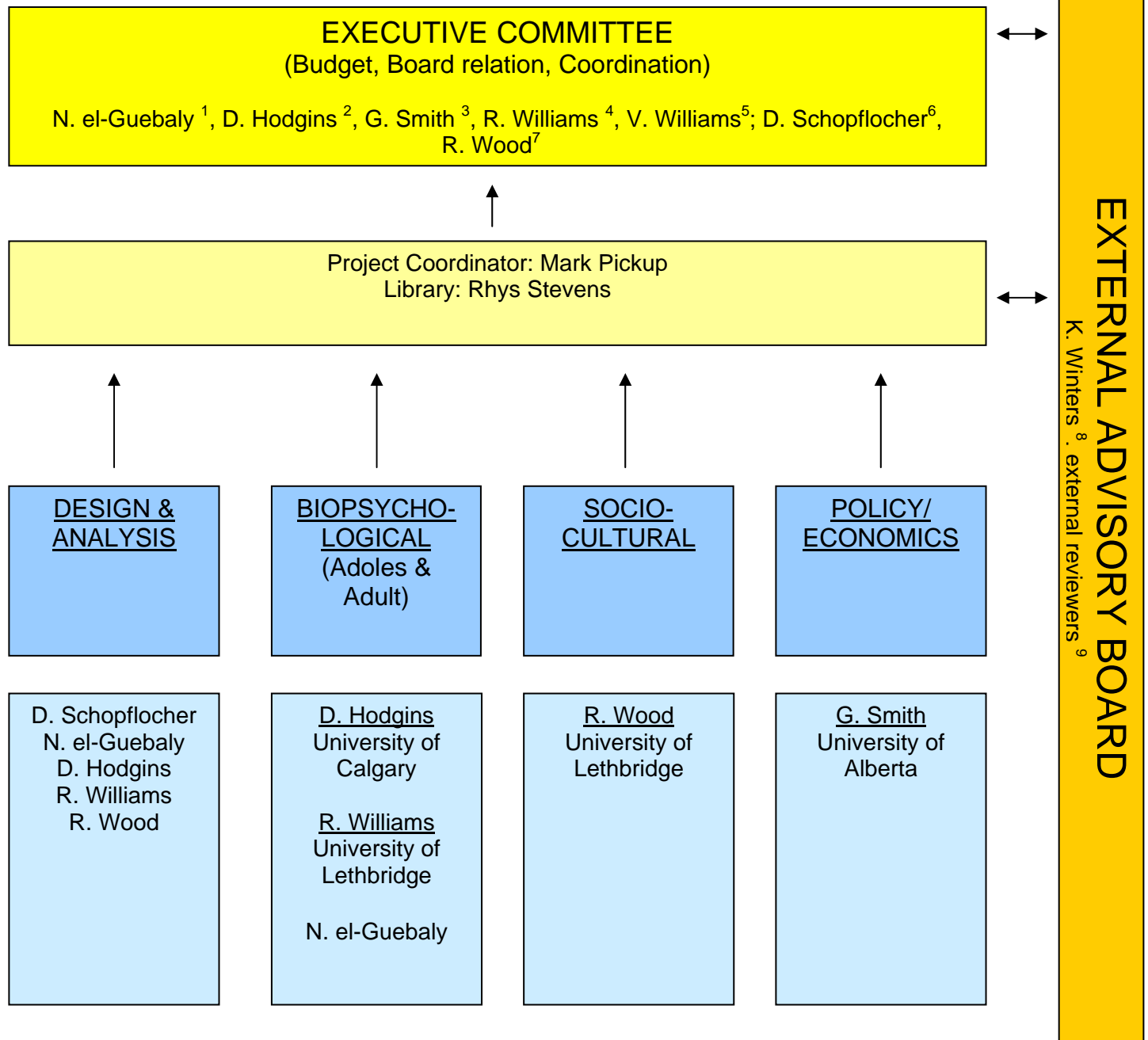
The budget presumes that the range of researcher expertise on the project planning committee, identified as the primary investigators, together with the complementary expertise of the research consultants, will provide the substantive data analysis. The PhD level 'Project Coordinator' will identify, address and/or refer specific data analyses requirements to the appropriate expert. Because of the 'distributed' nature of the data analyses, there is no separate line item on the budget.

The resources required for research assistance were calculated based on the estimates of time required to carry out the telephone and face-to-face interviews (including travel) for the pilot study and Year 1 and the average cost of follow-up interviews (specific format yet to be determined) for Years 2 to 5.

It should be pointed out that given the total number of data items, longitudinal studies may actually be less costly than multiple cross-sectional studies because the costs of sampling and instrument development may be lower in follow-up assessments. Also, it is less costly to carry out several studies with the same individuals than incurring the subject recruitment costs with different individuals for each study. The recruitment of subjects has been a uniformly problematic issue for our research in Alberta as well as in other jurisdictions.

Fixed interval follow-ups work best to express rate of change over equivalent periods of time and the study of the onset of new behaviors. In the Pittsburgh Youth Study, half-yearly assessments with contiguous assessment windows were chosen but for reasons of economy, different intervals of assessment were chosen for different variables; e.g., health was measured only yearly, intelligence may be measured only once (Jordan, 1994). It is anticipated that a 3-month window for data collection should be appropriate.

H. COHORT ORGANIZATIONAL STRUCTURE



LEGEND

1 Chair, AGRI, University of Calgary; 2 Node Coordinator, University of Calgary; 3 Node Coordinator, University of Alberta; 4 Node Coordinator, University of Lethbridge; 5 CEO, AGRI; 6 Alberta Health and Wellness; 7 University of Lethbridge; 8 University of Minnesota; 9 to be determined

I ANTICIPATED BENEFITS

1. This Alberta project will provide the first set of data on the range of gambling behaviors across the lifecycle for both genders as well as their interaction with a set of variables across the biological, psychological, social and environmental range. It should inform the debate about the benefits and limitations of exposure to gambling outlets across the lifecycle. Economic data will also be included.
2. It will provide the first set of population-based incidence data across the life-cycle.
3. It provides a common data bank to all domains.
4. The potential for validating screening instruments for problems across the lifecycle also exists.
5. It is a model for a strong collaborative project across Alberta's universities.
Designing the proposal in itself was an enriching experience for all involved.
6. It may become a catalyst for inter-provincial collaboration and possible Canadian Institutes of Health Research involvement.

APPENDIX 1: LONGITUDINAL STUDIES IN THE FIELD OF ADDICTION – INSIGHTS AND LIMITATIONS

ADDICTION

<u>STUDY</u>	<u>FOCUS</u>	<u>POPULATION</u>	<u>DESIGN</u>	<u>KEY FINDINGS</u>
Beardslee, Son & Vailant, 1986 -William T. Grant Foundation Faculty Scholar Award -Harris Foundation Overseas Shipholding Group	Psychosocial influences on children of alcoholics	n = 176 COAs, 230 controls age = childhood, 25, 31 yrs., 47 (+/- 2 yrs.)	-Used data from 40-yr study of working class families (Gluecks) m = parent and teacher interviews, family history search of 1 st degree relatives for criminal behaviour and alcohol involvement, Wechsler-Bellevue Intelligence test, Social Class Scale, Alcohol Abuse Scale, Alcohol Abuse in Relatives Scale, Exposure in Childhood to Alcoholism in the Family Environment Scale, Health Sickness Rating Scale (%), Social Competence Scale, Mood Disturbance Scale, Alcohol Dependence Scale, time in jail (%), Problem Drinking Scale, Sociopathy Scale	-Family history of alcoholism and alcoholism in a child's immediate environment both contributed to development of alcoholism -Increased exposure to alcoholism was related to: later use of alcohol, alcoholism, incarceration, sociopathy, death -Exposure is not related to poor physical health, unemployment, adult ego functioning -Overall adult functioning is the same between the two groups when alcoholic subjects are eliminated
Schulsinger, Jachin, Goodwin, Teasdale & Mikkelsen, 1986 -National Institute of Alcohol Abuse and Addiction -Danish Medical Research Council	Children of alcoholic fathers	n = 204, 134 high risk (COAF), 70 controls fu age = 19-20 yrs. selected from a pediatric and obstetric study followed since birth	-matched with controls on date of birth (+/- 6 months), mothers age (+/- 2 years) and parity number (+/- 1), biological father's social class (+/- 2 points), parental marital status at birth -assignment to high risk group if biological father had been admitted to psychiatric treatment for alcohol use and/or used alcohol treatment services m = physical exam, neuropsychological tests, neurophysiologic measurement, Social History Interview, psychological interview	-High risk group had significantly different social history - i.e., fewer intact families, experienced more critical economic periods, familial alcohol problems, parental marital crises, academic problems, were more impulsive, less antiaggressive and less shy -No difference between the two groups in alcohol or drug use, tolerance, attitudes and incidence of psychological disorders
Anderson & Magnusson, 1987 -Swedish Council for Planning and Coordination of Research -Committee for	Adolescent alcohol use and subsequent adult alcohol abuse	n = 710 Swedish males age = 15-25 yrs	-Used Data from Individual Development and Adjustment study following 710 boys from grade 3 m = alcohol use, records from: police, social authorities and psychiatric services	-Early adolescent drinking patterns do not reliably predict alcohol abuse in adulthood -High levels of adolescent drunkenness and involvement with police, social authorities and/or psychiatric services between 15-17 yrs. Increases risk of continued alcohol abuse as an adult

Social Research -Bank of Sweden Tercentenary Foundation				
Lehman & Joe, 1987	Predicting outcomes for opiod addicts	n = 490 opiod addicts mean age = 34 at 12 yr. FU	-Followed at 6 and 12 years after treatment -Longitudinal and crossectional	-Longitudinal outcome classification predicts patterns of change and 12 yr. outcomes -Longitudinal classification more robustly predicts outcome over and above cross-sectional classification
Berglund, 1988 -Swedish Medical Research Council	Sub-groupings of alcoholics	n = 383 alcoholics in compulsory treatment, 383 control alcoholics matched on age and sex	-Followed groups admitted to treatment (voluntary or not) from 1949-1969 with FU in 1981 m = Problem Drinking Scale, alcohol use, Multidimensional Diagnostic Schedule	-Compulsory treatment group had: slight cerebral dysfunction/ personality change, antisociality/criminality, impaired social and work performance -More deaths related to alcohol and impaired social adjustment in the compulsory txt group
Griffiths, 1990 -United Kingdom Economic and Social Research Council	Fruit machine gambling in adolescence	n = 50 adol. fruit machine players age = 16.2 yrs. males-39 females-11	-face-face int, questionnaire m = acquisition, development and maintenance of gambling behav.	-18% were pathological gamblers (all male) -Pathological gamblers started earlier than non, with parents or alone. All other acquisition factors were similar between the two groups -Sociological factors implicated in acquisition -Psychological and physiological factors implicated in development and maintenance
Pandina & Johnson, 1990 -National Institute on Alcohol Abuse and Alcoholism -National Institute on Drug Abuse	Children from alcoholic families	n = 1380, follow-up (92%) = 1,270 326 pos. family history, 1054 neg. family history T1 = 12, 15, 18 yrs T2 = 15, 18, 21 yrs T3 = 18, 21, 24 yrs 90% white adolescents	-Used data from the Rutgers Health and Human Development Project -Community-based sample m = self-report questionnaires, family medical history, alcohol and marijuana use, coping use	-Pos. family history leaves offspring at heightened risk for negative outcomes related to drugs and alcohol -FH+ are 2 x's more likely than FH- to experience problems with alcohol and drugs -FH+ do not differ from FH- in patterns of use and frequency of negative consequences of use -FH+ females are as likely as FH+ males to report difficulties

Vaillant, Schnurr, Baron & Gerber, 1991 -National Institute of Mental Health	Influence of tobacco and alcohol abuse on mortality	n = 237 from prior college sample age = 50-68 yrs., 366 from the inner city sample, age = 47-59 yrs	-Used data and participants from Gluecks' (1950) and Heath's (1945) studies m = cig. and alc. use, mortality	-Heavy smoking was correlated with a increase in mortality amongst the college sample -Alcohol abuse was related to increased mortality in both samples -Heavy alcohol use is associated with heavy smoking
Holder & Blose, 1992 -National Institute on Alcohol Abuse and Alcoholism	Alcoholism treatment and health care costs	n = 3, 068 treated alcoholics, 661 non-treated	-Used insurance claims filed over a 14 year period -Examined the total cost of medical services used for the treated vs. non treated alcoholics -2 designs - interrupted time series and 2 group pre/post design	-Treated alcoholics have health care costs that are 24% lower than non treated -Costs decrease 23-55% from pre-treatment levels for alcoholics (post treatment) -Costs for untreated alcoholics increase over time
Wills, Vaccaro & McNamara, 1992 -NIDA	Risks and protective factors for adol. substance use	n = 1289 age = 11-13 yrs.	m = questionnaire, life events, family support, competence scales, positive and negative affect, substance use	-Negative life events and neg. affect are related to an increase in substance use -Academic competence, adult relationships, positive affect, parental support (both instrumental and affective) are related to decreased substance use -Protective factors are most important when high level of risk
Johnson & Pandina, 1993 -Alcohol Beverage Research Foundation -NIDA -NIAAA	Stress, coping and alcohol use	n = 1270, nonclinical sample T1 = 12, 15, 18 yrs T2 = 15, 18, 21 yrs T3 = 18, 21, 24 yrs	-Used data from Pandina et al. '84 -Random telephone sampling followed by a 6 hour in-home interview -FU = 95% m = medical histories, questionnaires, behavioral, physiological, stress and coping measures, consumption and consequences of use, family drinking history	-Increase in alc. consumption from 12-21, with stabilization at 24 yrs -Alc-related problems rose from age 12, were highest at 18 yrs and then declined -Higher stress at younger age related to alc.-rel. probs, irrespective of coping styles -More females had a pos family history, higher stress levels and more positive coping, with less alc-related difficulties -FH+ reported more stress and alc-related problems but similar consumption rates to FH-
Bailey, Hser, Hsieh & Anglin, 1994 -Cigarette and Tobacco Surtax fund of the State	Influences on the maintenance and cessation of narcotics addictions	n = 354, male, narcotics addicts remanded to the California Civil Addict program mean age = 24.5 yrs.(initial	-Used data from a cohort followed 24 years (0, 12-13, 23-24) -Classified the addicts into 4 groups (abstinent, using drugs but not narcotics, using narcotics and other drugs, varied drug use and incarcerated) m = family history and family lifestyle variables,	-Self-motivation was central to influencing course of addiction -Significant differences between users and non users (of both narcotics and other drugs) in areas of: family life, familial emotional support when quitting, early childhood and adolescent behaviors, peer relationships, self-

of California -NIDA Research Scientist Development Awards		interview), 47.6 yrs (10 year interview) 57.6% Hispanic, 34.5% White, 7.9% African American	early childhood and adolescence, peer relationships, age of initial involvement with drugs, patterns of drug use, criminal involvement, urinalysis, treatment experiences	confidence, self-determination and perceptions of treatment -Positive family relationships, limited contact with "using" peers were negatively correlated with cessation and/or criminal involvement -Early drug use, early criminal involvement and contact with narcotic-using peers were positively correlated with cessation
Harford & Parker, 1994	Adolescent antisocial behaviour as predictor of alc. dependence	drawing on data from the 9-yr National Longitudinal Survey of over 12,000 14-21 yr old	-Used data from the National Longitudinal Survey of Youth m = alc. Dep., alc. use, antisocial behav., family history of alcoholism, SES, demographics	-Significant relationships between the development of alc. Dependence and antisocial behaviors -Antisocial behaviors were not dependent on SES or having a positive family history of alc. -Increased risk of dependence if had both antisocial behav. and a positive family history
Lynskey, Fergusson & Horwood, 1994 -Canterbury Medical Research Foundation -Health Research Council of New Zealand -National Child Health Research Foundation	Familial alcoholism and development of adolescent psychiatric disorders	n = 961 FU = 76%	-Used data from Christchurch Health and Development Study -Followed from birth, 4 months, 1 year, yearly through to 15 years m = parental and child interviews, teachers, medical and police records, family history of alcoholism, adolescent psychopathology, Revised Behaviour Problem Checklist, Diagnostic Interview Schedule for Children, Early Delinquency Scale	-Children of alcoholics have 1.6-3.0 times higher incidence of psychiatric disorders -No differences between males and females -Poorer outcomes if from homes with alcoholism or alcohol use
Muetzell, 1994	Alcohol use, drug use and mortality, suicide and sociopathy	n = 211 male alcoholic inpatients and their 201 children, 200 male controls and their 189 children	-Followed 15 years -Divided into 4 groups-controls with low to moderate alc. use, controls with low to mod. alc. use and drug use, alc. Inpatients w/o drug use and alc. inpatients with drug use m = mortality, suicide, sickness, social and medical histories, registry data, lab tests, EneG	-Children of alcoholics have higher levels of addictions, maladjustment, somatic and psychiatric disorders -Alcoholics who use drugs and controls who use moderate amounts of alcohol and drugs have more psychosocial problems than non drug users -Parental drug and alcohol use influences offspring

Dewitt, Sherman Goodstadt & Stoduto, 1995	Cumulative effects of risk and protective factors	n = 400 (33% response) grade 9 students 70% female age = 14 yrs.	-high risk screening self-report questionnaires DV m = overall drug involvement, frequency of alcohol use, frequency of illicit drug use, frequency of drug/alcohol abuse, quantity of daily cigarette use IV m = age of onset of negative/significant life events, peer-related variables, school-related variables, family-relationship variables, personality traits, behavioral variables, SES, demographics	-Absence of risk factors does not = protection -Multiple protective factors decrease likelihood of drug use more in high risk situations than in low risk -Risk and protective factors vary depending on drug situation -Interaction effects -Greater number of risk factors experienced = greater likelihood of substance use
Johnson & Bennett, 1995 -NIDA -NIAAA	Family histories of alcoholism	n = 1021, 620 f age = 12-18 (T1), 25-31 (T2) 90% white	-Used data from the Rutgers Health and Human Development Project -Followed 13 years m = Family History Research Diagnostic Criteria, face-face interviews, cognitive tasks, parental questionnaire, medical records	-Incidence of familial (parental, sibling and grandparent) alcoholism appears to increase over time
Muetzell, 1995	Children of alcoholics	n = 211 male alcoholic inpatients and their 201 children, 200 male controls and their 189 children	-Used data from Muetzell, 1993 : data from original study provided information for several research articles	-Children of alcoholics have higher levels of social maladjustment, addictions, somatic and psychiatric disorders -Boys are more vulnerable than girls
Rossow & Amundsen, 1995	Alcohol abuse and suicide	40,000 male Norwegian conscripts	-Used data from conscription records, records of treatment for alcohol related concerns, death records m = medical and psychological information, psychological tests, structured interviews, educational level, social background, degree of self-confidence -alcohol abuse operationalized as admission to alcohol treatment and/or cause of death -social class operationalized as highest educational level attained	-Suicide risk increases 7x's with alcohol abuse -Suicide risk increases over the age of 40 -Higher suicide mortality and higher prevalence of alcohol abusers among those who commit suicide -Life-time risk of suicide 0.63% for non alc. abusers and 4.76% for alc. abusers

Schuckit, 1995 -NIAAA -Veterans Affairs Research Service	Family history of alcoholism and response to alcohol	n = 424 sons of alcoholic fathers and controls age = 30 yrs at FU	-Pooled data and participants from assorted previous studies -Participants had alcoholic or non alcoholic fathers and were matched on race, age, education, patterns of substance use at age 20 -face-face interviews m = personality and cognitive tests, given alcohol or placebo and had physiological, motor and perceptual tests for 3 hours post-consumption -age 30, tested relationship between results of previous tests and risk for alcoholism FU = 99.3% m = psychiatric disorders, collateral interview, blood and urine tests	-Having an alcoholic father was not related to significant differences in personality measures or cognitive functioning -Sons of alcoholics had significantly lower response rates to alcohol, 3xs the risk for dependence and 2xs the risk for abuse
Chen, Scheier & Kandel, 1996 -NIMH -NIDA	Chronic cocaine use and health	n = 532 males, 620 females followed from New York high school sample (general population) age = 34-35	-Used 90 minute, in-home structured interviews -Fu = 71.7% -Data available for ages 16-17, 24, 28-29, 34-35 m = health problems, drug use, sociodemographics	-chronic cocaine use prior to late 20's is related to higher levels of health problems for males -decreased health related to continued cocaine use
Rossow & Amundsen, 1996 -Norwegian Research Council	Alcohol abuse, mortality and social class	n = 40,000 male Norwegian conscripts 19+ yrs.	-Used data from conscription records, records of treatment for alcohol related concerns, death records m = medical and psychological information, psychological tests, structured interviews, educational level, social background, degree of self-confidence	-Increased risk of premature death before age 60 if previously enrolled in alcohol treatment -Relative risk of death higher for more educated individuals -Absolute risk of death equal across social classes
Schuckit & Smith, 1996 -NIAAA -Veterans Affairs Research Service	Sons of alcoholics	n = 450 mean age = 31 +/- 3 yrs	-Used participants from Schuckit et al (1994) -8 yr FU -Face to face int., collaterals m = blood, urine samples, DSM III-R diagnoses for substance use, Schedule for Affective Disorders and Schizophrenia, family history of substance use and psychiatric disorders	-Positive family history related to 3x's risk -Pos. fam. hist. not related to risk for psychiatric disorders -Fam. hist. of psychiatric disorders not related to alc. use -Physiological reaction to alcohol may mediate risk

Schulenberg, Wadsworth, O'Malley, Bachman & Johnson, 1996 -NIAAA -NIDA -Survey Research Center's Angus Campbell Fellowship	Risk factors for binge drinking	n = 6862 age- 18-24	-Used Data from the Monitoring the Future Project m = binge drinking, background variables, personality characteristics, drinking motivations, and expectancies, social context characteristics	-Risk factors for binge drinking at 18 and 24 included being male, having lower social conservatism and pro marriage value, greater drinking to get drunk and expected future use -Some future risk factors are contingent on initial level of binge drinking -Low internal control was a general risk factor -Protective factors: higher internal control, dissatisfaction with current social context and sense of connection to future roles
Sher, Gotham, Erickson & Wood, 1996 -NIAAA	Relationship between tobacco dependence and alcohol use disorders	n = 452 college freshmen	-Used data from Sher et al., 1987 -FU = yrs. 1, 4, 7	-High incidence of alcohol use disorders in freshmen decreases over time -Increased risk of AUD for males with familial history of alcoholism -Tobacco use disorders and AUD influence each other -TUD are more stable than AUD over time -Increased risk of TUD with family history of alcoholism
Vaillant, 1996 National Institute of Mental Health	Course of alcohol abuse	n = 724 (? alc. abusers) 268 Harvard undergrads fu@ 47 yrs - 249, fu@ 60-70? 456 non delinquent inner city youth, fu@ 47 yrs - 433, fu@ 60?	-Used data from Gluecks' study and followed-up on participants from 40-70 yrs. -dv = mortality and alcohol use status m = alcohol questionnaire biennially since 47 yrs, physical exam records every 5 years, alcohol use interview @ 48+/- 3 yrs., health, work, relationships	-Inner city youth had earlier onset and higher levels of abuse and dep, but achieve earlier abstinence -Harvard undergrads had prolonged abuse -Negligible relapse after 5 years of abstinence and no relapse after 6 yrs. -alc. abusers have 2 x's mortality than non -alc. abuse declines with age
Vaillant & Hiller-Sturmhofel, 1996	Drinking behav. and consequences over time	n = 724 (? alc. abusers) 268 Harvard undergrads fu@ 47 yrs - 249, fu@ 60-70? 456 non delinquent inner	-Used data from Gluecks' study and followed-up on participants from 40-70 yrs. -dv = mortality and alcohol use status m = alcohol questionnaire biennially since 47 yrs, physical exam records every 5 years, alcohol use interview @ 48+/- 3 yrs., health, work, relationships	-Progressive course of alcoholism over time for most – some remained abusers or abstained -Maintenance of controlled drinking was minute -AA was only txt. to significantly effect recovery -Psychiatric disorders developed after alc.

		city youth, fu@ 47 yrs - 433, fu@ 60?		-Risk factors = ethnicity and genetics
Vitaro, Dobkin, Carboneau & Tremblay, 1996 Counsel Quebecois de la Recherche Sociale	Sons of alcoholic fathers	n = 62 sons of male alcoholics, 249 controls mean age - 6 when study initiated fu - 10, 12, 14 yrs old	-selected participants from an ongoing longitudinal study -sons of male alcoholics and non divided into 3 groups (sub. abuse with school probs. And/or delinquency, school probs. with/o school or sub. abuse, delinquency with/o school problems or sub. abuse) m = telephone interview with parent, Short Michigan Alcohol Screening Test for mother and father, DIS, Dimensions of Temperament Survey, Social Behaviour Questionnaire, family structure, education level of parent(s), mother's age @ birth of first child, Blishen, Carroll & Moor Scale, supervision, punishment and home rules, Pupil Evaluation Inventory, Academic perf, Self-Reported Delinquency Questionnaire, Personal Experience Screening Questionnaire	-Few difference between control group and sons of alcoholics -Better academic perf. for no problem controls and non problem somas -No problem somas were less aggressive-oppositional, inattentive and hyperactive than problem controls and problem somas (dependent on age)
Vitaro, Ladouceur & Bujold, 1996 -Social Sciences and Humanities Research Council of Canada -Health Research Fund of Quebec	Gambling, delinquency and substance use	n = 631 males age = 10, 11, 13 yrs.	m = Blishen and McRoberts Occupational Prestige scale, Social Behaviour Questionnaire, gambling, substance use, delinquency, Self-Reported Delinquency Scale, Personal Experience Screening Questionnaire, teacher and mother ratings, impulsivity, hyperactivity, aggression, anxious/ withdrawn	-Gambling moderately related to delinquency and substance use -Delinquency more strongly related to substance use -Low harm avoidance precedes gambling -Hyperactivity, impulsivity, and aggressiveness were not antecedents of gambling

Barnes, Welte, Hoffman & Dintcheff, 1997 -Center for Substance Abuse Treatment	Cohort adolescent alcohol use	-7 th -12 th grade students n = 27,335-1983, 23,860-1990, 19,321-1994	-Surveyed students in grades 7-12 in '83, '90, '94 m = demographics, substance use and consequences	-alcohol use, heavy drinking and related problems increased from '90- and were found to occur at earlier ages
Gotham, Sher & Wood, 1997 -NIAAA	Alcohol use, individual factors and role transitions	n = 288 college students mean age = 21. 23 in year 4 95% white	-Used data and participants from Sher et al., 1991 -Assessed at year 4 and year 7 m = personality traits, alcohol expectancies, alcohol involvement, role transition variables	-Alc. use decrease with age -Individual differences and role transitions influence the course of alc. Use -Males have higher usage than females -Working full-time, being male and less open to experience decreases alcohol use after college
Hawkins, Graham, Maguin, Abbott, Hill & Catalano, 1997 -Robert Wood Johnson Foundation -NIDA -NIAAA	Age of onset, psychosocial risk and alcohol use	n = 808 students and their caretakers age=10-18 FU = 94%	-Used participants from Seattle Social Development Project -Recruited at 10-11 yrs. and followed yearly till 17-18 m= alcohol misuse, demographics, family history, proactive parenting, school bonding, friends' alcohol use, initiation of use, perceived alcohol harm	-Early onset related to increased misuse at 17-18 -Age of initiation moderates effects of parents' drinking, ethnicity, proactive parenting, school bonding, friends' alc. use, and perceived harmfulness
Sher, Gershuny, Peterson & Raskin, 1997 -National Institute on Alcohol Abuse and Alcoholism -National Institutes of Health Office of Research on Women's Health	Children of alcoholic families, childhood stressors and alcohol use disorders in adol. and early adulthood	n = 457 freshmen 234 positive family history (110M, 124 F) 223 negative family history (109M, 114F) age = 18.54 +/- 0.98 yrs fu age = 24.47 +/- 0.97 yrs 93% follow-up at year 7	-data obtained from year 7 of an ongoing study of COA fathers (Sher, 1991) m = Short Michigan Alcoholism Screening Test for both mother and father, Family Research History Research Diagnostic Criteria Interview, diagnostic interview, questionnaires, neuropsychological tests, Childhood Life Events Interview, Alcohol abuse or dependence screening (DIS-III-R)	-Positive family history related to experiencing a range of childhood stressors, with females encountering more stressors than males -+ family hist. related to experiencing more instability in family, maladaptive parental behaviour, public embarrassment, disruption of family rituals, physical and sexual abuse -Exposure to certain childhood stressors was moderately related to the development of alcohol use disorders

Carboneau, Tremblay, Vitaro, Dobkin, Saucier & Pihl, 1998 -Conseil Quebecois de la Reaccherche -Social Sciences and Humanities Research Council of Canada	Influences of parental alcoholism and absence on the development of behav. problems	n = 642 boys low SES age = 6 yrs T1, 12 yrs at FU	-Used participants from Tremblay et al. (1994) -telephone surveys and teacher questionnaire m = parental alcoholism, family structure, teacher ratings	-Sons of alc. are more oppositional and hyperactive -Sons of alc. are distinct from sons of controls in areas of physical aggressiveness and low anxiety
Cottler & Cunningham-Williams, 1998 -NIMH funded	Incidence of gambling problems among drug users	Baseline: N = 3004 Households; Wave 1 – 75% reinterviewed; Follow-up: 162 drug users reinterviewed	- Recruited from the St. Louis Epidemiological Catchment Area - 11 year follow-up (baseline, 1 year follow-up, 11 year follow-up) - Sample: drug users 18-24 at baseline	- Baseline non-gamblers who became gamblers: 33% → 22% of which became problem gamblers and 5% became pathological gamblers - 24 % of baseline recreational gamblers developed a problem - 29% remained “at-risk” gamblers - 11-year incidence rate of problem/PG gambling = 12% - Predictors of become/remaining a problems gambler: male, African-American, city dweller, laborer, childhood conduct problems
Conrad, Hultman, Pope, Lyons, Baxter, Daghestani, Lisiecki, Elbaum, McCarthy & Manheim, 1998 -Health Services Research and Development Services, Department of Veteran Affairs -The National Institute on	Treatment interventions for homeless, chemically dependent veterans	n = 358 male, veterans mean age = 40 yrs, range 25-70 25% comorbid psychiatric disorders 75% African American, 25% White	-5 year, randomized controlled trial – pretest multiple posttest (3,6,9,12,18,24 months) -2 groups assigned to: case-managed residential care program or customary care m = Personal History Form, PHF Literal Homelessness Index, Addiction Severity Index,	-all groups showed significant improvement with treatment -CMRC more effective than customary care, but differences decrease after 9 months -CMRC showed improvements on medical, alcohol, employment and housing measures

Alcohol Abuse and Alcoholism				
Jennison & Johnson, 1998	Adult children of alcoholics	n = 12, 686, 50.2% m, 49.8% f n positive FH ? age = 19-27 (T1), 24-32 (T2) T1 - 59% white, 25% African American, 18% Hispanic	-Used data from 2 waves ('84, '89) of the NLSY m = familial alcoholism questionnaire, alcohol consumption patterns index, background characteristics, drinking-related indices, selective social indicators, problem drinking/early dependence symptoms	-Having alcoholism on the father's side of family most strongly influences the development of alcohol dependence -Alcoholism on the mother's side also influences the dev. Of alc. dep. -Increased risk for both female and male adult children of alcoholics to experience earlier onset, drink heavily and develop dependence more frequently than non COA's (but males have higher risk than females) -Increased risk for dependence when both smoke and consume alcohol
Barnes, Welte, Hoffman, Dintcheff, 1999 -National Institute on Alcohol Abuse and Alcoholism	Predictors of gambling and alcohol use in adolescence	Community sample of adol. from Buffalo NY	-Combined data from 2 studies -#1 – random-digit-dial sampling, 6 waves ('89-96), paid at each wave, in-home interviews with adol and min. one (max 3) other family member (s), T1+ 699 (FU= 90%) -#2 – random-digit-dial sampling, 3 waves @ 18 month int. ('92-97), paid at each wave, 625 (FU= 90%) m = alcohol consumption, gambling frequency, gender, race/ethnicity, impulsivity, moral disengagement, parental monitoring, peer delinquency, cig. Use, illicit drug use, delinquency	-Impulsivity, moral disengagement, peer delinquency and delinquency predict alcohol use and gambling -Illicit drug use, cig. use and parental monitoring predict alcohol use
Abbott, Williams, & Volberg, 1999	Frequency of problem gambling in the community	N = 143 of the participants from phase 2 of the study	- Component of the New Zealand Gaming Survey - A 7-year follow up - m = lifetime and 6 month gambling participation; SOGS-R; recall of gambling advertisements, preferred type/frequency/expenditures/social context, etc; perceived cost & benefits; sociodemographic	- Large reduction in gambling involvement and gambling-related problems who were classified as current probable PG and problem gamblers 7 years earlier - Participants with less severe gambling problems evidenced very high rates of change over time; very few remained problem gamblers and most became non-problem

			info; general life satisfaction; GHQ-12; AUDIT	gamblers - Strongest predictors of current PG and problem gambling 7 years later were track betting, current problem gambling status and alcohol problems
Bradizza, Reifman & Barnes, 1999 -NIAAA	Predictors of alc. use in adol.	n = 699 adol. from community sample age = 13-16 yrs. FU = 71%	-Random-digit-dial -face-face interviews -inclusion of mothers and fathers -Y1,2,3,,4,5,6 m = reasons for drinking, psychological distress and alcohol misuse	-Drinking for social reasons is more predictive than coping reasons in mid-late adolescence (vs. early) -Social motives (vs. coping) are more predictive of drinking for whites
Sher & Gotham, 1999	Developmental assessment of alcohol use disorders in COAs	n = 451 college freshmen (252 FH+) -FU = 93.7%	-REVIEW of significant findings from on-going study (Sher et al. 1991) -5 waves over 7 years (yr. 1, 2, 3, 4, 7) m = Short Michigan Alcoholism Screening Test for mother and father, Family History Research Diagnostic Criteria, gender, alcohol expectancies, vulnerability index, behavioral under control variables, negative affectivity, Childhood Life Stressors interview	-Chronic, rare, decreased and increased developmental pathways to AUD -Developmentally limited alc. and emerging chronic forms of alc. Found -Negative affectivity carries a 2xs risk for development of alc. -Role socialization related to "maturing out"
Oyefeso, Clancy, Corkery & Goldfinch, 1999	Mortality and teen drug use	n = 9491 15-19 yrs. old cohorts followed for 20 yrs. controls and addicts	-Followed successive cohorts aged 15-19 from 1974-1993 -Identified addicts via registry with Addiction Index and referred to Home Office for treatment -death records	-Addicts 12x's more likely to die than non addicts of the same age -Females have 2x's higher chance of death than males -Accidental poisoning most common means of death
Griffin, Botvin, Epstein, Doyle & Draz, 2000	Influences of early adolescent risk and protective factors on heavy drinking in high school	n = 1132 age = 18.1 years 54% male	-Used data from Botvin et al. 1995 -Questionnaires in grades 7 and 12 m = substance use behaviour, drinking expectancies and knowledge, friends' substance use	-16% of sample were heavy drinkers by gr. 12 -Experimentation with cig. or alc., having a majority of friends drink, and poor behavioral self-control in gr. 7 was predictive of heavy drinking in gr. 12 -Gender differences - pos. alcohol expectancies in gr.7 predicted later heavy drinking for males while friends' smoking predicted heavy drinking for females

Harford & Muthen, 2000 -National Institute on Alcohol Abuse and Alcoholism	Youth antisocial behaviours and subsequent adult alcohol use disorders	n = 7326 age = 15-22 (initial), 29-34 (follow-up) 48.8% male 30.2% black	-Used initial data from the National Longitudinal Survey of Youth and followed-up 14 years later m = assessment of alcohol abuse and dependence, antisocial behaviour questionnaire, family history of alcohol problems, initial drinking age, background variables, race, marital status, drop out status	-Early use of illicit substances and adolescent delinquency are correlated with the development of alcohol use disorders -Early illicit use associated more with alcohol abuse than dependence -Person offenses, alcohol abuse and dependence are related
Hoffman, Barnes, Welte & Dintcheff, 2000 -NIAAA	Cohort concurrent use of alcohol and illicit drugs	-7 th -12 th grade students n = 27, 335-1983, 23,860-1990, 19,321-1994	-Used data from surveys m = substance use, demographics	-Concurrent use of alcohol and marijuana dropped from '83-'90 and then increased -Use of alcohol and cocaine/crack remained the same -Being male and of an older age increased chance of using alcohol and illicit drugs -Ethnic differences
Jackson, Sher & Wood, 2000 -National Institute on Alcohol Abuse and Alcoholism	Comorbidity of alcohol use disorders and tobacco use disorders	n = 450 college freshmen mean age = 18.5 47% male 51% family history of alc.	-Used data from Sher et al. 1991 -5 waves over 7 years (yr. 1, 2, 3, 4, 7) m = Short Michigan Alcoholism Screening Test for mother and father, Family History Research Diagnostic Criteria, gender, alcohol expectancies, vulnerability index, behavioral under control variables, negative affectivity, Childhood Life Stressors interview	-AUD & TUD partially explained by family history and mediated by childhood life stressors, alcohol expectancies and behavioral undercontrol -State-trait model best accounts for complexity of comorbidity -Common third variable model supported for comorbidity (vs. directional model) -Gender and pos. family history predicted 5 courses of alcohol and/or tobacco use disorders -Third variable (i.e., childhood stressors, alcohol expectancies, and behavioral undercontrol) moderate the relationship with family history
Jacob & Windle, 2000 -NIAAA -Research Career Scientist Award from Veterans Affairs	Adult children of alcoholics	n = 128 adult children of alcoholics, 138 controls, 127 children of depressed fathers	-10 yr. FU -Phone interviews and questionnaires m = SADS-L, educational perf, alc. Diagnoses, drinking consequences, personality, behav. Undercontrol, negative affect, major dep, drug use diagnoses, anxiety disorders, childhood educational attainment, occupational attainment, employment status, social	-Children of alcoholics had more problems in areas of drinking, personality/psychopathology & educational/social functioning

			adjustment	
Johnson & Pandina, 2000	Influences of stress, coping and gender on alcohol use	n = 411 age = followed at 12, 15, 18, 25 89% white	-Used participants from Rutgers Health and Human Development Project who were initially tested at age 12 -face-face interviews and tasks over 6 hours period m = self-report questionnaires, stress, coping, alcohol use, behavioral tasks, cognitive tasks and physiological measures	-Negligible differences in measures at age 12 -No differences in stress or coping in problem and non-problem alcohol users at age 15 -15 yr old, dependent females used more emotional coping -More dependent males than females at 25yrs -Dependent females had more alcohol-related problems -Stress and coping styles occurring within the last 3 yrs were more predictive of alcohol problems
Kandel & Conrad, 2000 -National Institute on Drug Abuse -NIDA research scientist award -National Institute of Mental Health/Mental Health Clinical Research Center	Longitudinal marijuana use	n = 708 (364m) High school students who used marijuana 10 or more times	-Followed 19 years (15-16, 24-25, 34-35yrs.) m = sociodemographics, drug use history, family history of drug use and psychiatric disorders, quality of parent-adoles. rel, drug use in social network, psychiatric probs., conventionality/deviance in adoles.	-Use less than 10 times were: more religious, fewer psychiatric probs., less involvement with using peers -4 main clusters (early onset-heavy use, early onset-light use, mid onset-heavy use, late onset-light use) of users identified by: age of first use, length of nearly daily use, persistence of use into adulthood -Risk factors: male, early onset of cig. and alc. use, using to enhance pos. affect, using peers, delinquency, and psyc. illness -Onset is delayed by using to decrease negative emotions and having superior academic perf. in high school
Muthen & Muthen, 2000 -NIAAA	Influences on the development of alcohol use disorders	n = 7857, FU = 93% age = 18-37	-Used data from the National Longitudinal Study of Youth m = alcohol use, background information	-Dropping out of high school is the strongest predictor of alcohol use problems after age 37 -Minority status is protective until 27 yrs., then same as non minorities -College students have more problems with alcohol until late 20's, then decreases

O'Neill & Sher, 2000 -NIAAA	Tolerance, withdrawal and alcohol dependence	n = 450 (FU 92%) age = 18 year 1 college freshmen	-Used participants from Sher et al. 1991 -Assessed at yr 1 and yr 7 m = DIS III-A, DSM III criteria for alc. abuse or dep., tolerance and withdrawal measures, alcohol related symptoms, alcohol use	-Alcohol use decreased by year 7 -Tolerance and withdrawal at year 1 predicted alcohol use and alcohol use disorders over 7 yrs. -Tolerance and withdrawal were found to vary with stage of development and drinking history
Sher & Bartholow, 2000 -NIAAA	Personality measures and substance use disorders	n = 489 college freshmen, 7 yr. FU = 457 FU age = 24.5 yrs.	-Used data from Sher et al '91 -Cross sectional -1,2,3,4,7 yrs FU -payment at each FU m = Tridimensional Personality Questionnaire, Eysenck Personality Questionnaire, DIS II-R, questionnaires	-Questionnaire sections measuring impulsive sensation seeking or behavioural disinhibition are best predictors of substance use disorders
Tanskanen et al., 2000	Examines the relationship between joint heavy use of alcohol, cigarettes & coffee, and the risk of suicide in a population with a high rate of suicide	N = 36,689 adult men and women who participated in the population surveys from 1972-1992 in Finland, age range 25-64	- Prospective cohort study - Mortality of cohort monitored for a mean of 14.4 years - 50% of the men and 80% of the women did not use any of the psychoactive substances heavily (alcohol, coffee, & cigarettes)	- 80% women and 50% men did not use any of the substances heavily - Joint heavy use of all 3 substances rare - Adjusted relative risk of suicide increased linearly with increasing level of joint heavy use of all three substances
Timko, Moos, Finney & Lesar, 2000 -NIAAA -Department of Veterans Affairs Office of Research and Development	Treated and untreated alcohol use disorders	n = 466 patients from an alcohol treatment center or detox unit FU = 80%	-Followed at 1, 3 and 8 years -4 groups (self-selected): AA, AA and formal treatment, formal treatment only, no treatment m = drinking patterns and problems, functioning, approach coping, avoidance coping	-AA at least as effective as formal at 8 yrs. -AA and formal treatment had slightly better outcomes at 1 and 3 yrs -Any treatment group is more likely to be abstinent than no treatment

Wood, Sher, & McGowan, 2000 -NIAAA	College alcohol use and role attainment	n = 429 college students	-Followed at Y1,2,3,4,7 -questionnaire and telephone int m = SMAST, FHRDC, educational attainment, occupational attainment, study, background variables, alcohol abuse or dep, frequency of heavy drinking	-College alc. use moderately related to negative occupational and academic attainment -Participants who were higher achievers in high school were more adversely affected by college alcohol use
Bargagli et al., 2001	Examine overall and cause-specific mortality among problem drug users attending treatment centers in Italy + evaluate differences in mortality between genders	Cohort of 11,432 problem drug users entering treatment between 1980 & 1995 - Sample primarily male (92%)	Followed up until May 31, 1997 (2-17 year follow up) -directly standardized mortality rates and standardized mortality ratios (+ 95% confidence ratios) were calculated	- Overall mortality risk among drug addicts was about 15 times higher compared to the general population of the same age among men & 38 times higher among women - Interventions directed specifically toward the reduction of baseline mortality is still needed
Ellickson, Tucker, Klein & McGuigan, 2001	Grade 7 and Grade 10 risk factors for alcohol misuse at Grade 12	N = over 4,200 – participants in the RAND Adolescent Panel Study	Longitudinal study over 5 years (measures at Grade 7, 10 and 12) Predictor variables: demographics, substance use z7 exposure, prodrug attitudes, rebelliousness and deviant behavior, self-esteem, family structure and relations, and grades	- Grade 7 predictors of alcohol misuse 5 years later included: early drinking onset, parental drinking, future intentions to drink, cigarette offers, difficulty resisting pressures to smoke, being white, being male, having older sibling, deviant behavior, and poor grades - In Grade 10 predictors of alcohol misuse 2 years later included drinking and marijuana use by self and peers, future intentions to drink, difficulty resisting pressures to drink and use marijuana, being male, coming from a disrupted family, and deviant behavior - Predictors of misuse in late adolescence can be identified by Grade 7 and are generally visible and modifiable: Prevention efforts should begin by early adolescence

Ferdinand, Bluem, & Verhulst, 2001	Associations between psychopathology in adolescence and tobacco, alcohol, and drug use	N = 787; 10-14 yr. olds from Dutch general population	<ul style="list-style-type: none"> - Followed up over 8 yr. Period - Measures: Child Behavior Checklist (CBCL) (at initial assessment, 2 and 4 year follow-up), Young Adult Self-Report (subst. abuse) (at 8-year follow-up) 	<ul style="list-style-type: none"> - Thought Problems scale best predictor of alcohol use - Thought Problems and Delinquent Behavior scales strongest predictors of smoking - Delinquent Behavior scale strongest predictor of drug use
Hser et al., 2001	Longitudinal patterns of heroin use, other substance use, health, mental health, employment, criminal involvement, and mortality among heroin addicts	N= 581, male heroin addicts admitted to program in California (California Civil Addict Programs - compulsory drug treatment program for heroin-dependent criminal offenders) during 1962-1964	33-year follow-up study updates information previously obtained from admission records and 2 face-to-face interviews conducted in 1974-1975 and 1985-1986; in 1996-1997, at the latest follow-up, 284 were dead and 242 were interviewed	<ul style="list-style-type: none"> - Group reported high rates of health problems, mental health problems, and criminal justice system involvement - Number of deaths increased steadily over time, heroin use patterns very stable for the group.
Perreira & Sloan, 2001	Changes in alcohol consumption co-occurring and following stress	N= 7731 individuals between ages 51 and 61 at baseline (3824 women and 3907 men)	<ul style="list-style-type: none"> Used 4 waves of the Health and Retirement Study (Participants interviewed every 2 years) - followed over a 6 year period - Baseline interviews in the home, subsequent interviews by telephone - used multinomial logit analysis to study associations between important life events and changes in alcohol consumption over study period - Measurements incl. CAGE scale (Instrument for clinical assessment of alcohol disorders), life events, chronic stressors, social skills and coping skills, and sociodemographics 	<ul style="list-style-type: none"> - Most persons did not change their use of alcohol over the 6 years. - Hospitalization and onset of chronic condition were associated with decreased drinking levels - Retirement associated with increased drinking - Getting married and divorced was associated with both increases and decreases in drinking - Changes in drinking behavior was associated with several life events occurring over a 6 year period
Prescott & Kendler, 2001	Association between marriage and lower alcohol consumption	N = 1986, women aged 17-61 (including twins)	-Data from longitudinal study of female twins used to address whether longitudinal drinking trajectories are more closely related to current marital status or to patterns of marital status over time	<ul style="list-style-type: none"> - Women who later divorced drank more than women who stayed married; divorced women who remarried drank less than divorced women who did not remarry. -Influence of marriage on alcohol consumption

			<ul style="list-style-type: none"> - Past-year alcohol consumption frequency and quantity were obtained on one to three occasions, over 8 years - Latent growth models were applied to study whether trajectories of alcohol consumption are altered at first marriage and differ for women with different patterns of marital status changes 	complex and not limited to view that marriage causes decreased drinking
Price, Risk & Spitznagal, 2001	Examine the patterns of illicit drug use, abuse, and remission over a 25 year period and recent treatment use	N = 841 – used the surviving members of a cohort that was comprised of 3 subsamples of Vietnam War enlisted men and civilian controls	Followed over a 25 year period - Previously surveyed in 1972 and 1974; retrospective measures from 1996-1997	<ul style="list-style-type: none"> - Relatively stable patterns of frequent use in adulthood - A majority attempted to quit but most did not use traditional drug treatment - Most drug abusers who had started using drugs by early 20s appeared to gradually achieve remission – spontaneous remission the rule rather than the exception
Sher, Bartholow & Nander, 2001 -NIAAA	Effects of Greek fraternity/sorority membership on drinking patterns	n = 319 college freshmen FU age = 24.5 yrs.	-Used data from Sher et al '91 m = sorority/fraternity membership, demographics, alcohol use, peer norms, alcohol expectancies, extraversion, novelty seeking, academic ability	<ul style="list-style-type: none"> -Greek fraternities and sororities consume more alcohol than non -Greek membership is not predictive of long term alcohol use disorders at 3 yrs. post college -Minimal influence of third variables on drinking (i.e. extraversion, academic ability, novelty seeking, etc.). -Drinking is influenced by peer/social alcohol norms (or perceived norms)
Brennan, Grekin, & Mortensen, 2002	Maternal prenatal smoking related to antisocial behavior in male and substance abuse problems in female	N = birth cohort of 4169 males and 3943 females born between 1959 and 1961 in Sweden	Participants followed from birth until adulthood -Attempt to replicate previous findings but in a large-scale longitudinal cohort study -Measure: during 3 rd trimester, mother's self-report of # of cigarettes smoked daily, offspring adult criminal histories, maternal age, SES, pregnancy complications, parental drug use, and parental criminal history & psychiatric history	Dose response relationship between amount of Maternal prenatal smoking and criminal arrests and psychiatric hospitalization for substance abuse in males and females

	offspring			
Winters et al., 2002	Youth gambling behaviors – including course and outcomes	N = 305 – mean age 16.0 at T1 (Baseline sample consisted of 702 participants)	<p>Stable rates of any gambling and regular gambling (weekly or daily) were observed across T1-1990, T2-1992, and T3 – 1997-1998</p> <ul style="list-style-type: none"> - telephone interviews at each time point - data collected incl: demographics, prior-year gambling frequency for 11 activities and signs and symptoms of gambling-related probs (SOGS-RA at T1&T2, SOGS at T3), prior-year alcohol and other drug use frequency, mental health status, school achievement, delinquent behavior, and parental history of gambling behavior, grade of onset 	<ul style="list-style-type: none"> - Important origins of young adult gambling problems are risk factors associated with the problem behavior syndrome of adolescence - Stat. signif. decr. in time for card playing, betting on games of personal skill, and betting on sports teams; Stat. signif. incr. for scratch tabs, gambling machines, and the lottery - At-risk gambling rates incr. over time, with incr. occurring at T3 - Prevalence rates for problem gambling remained stable and low - Factors assoc. with increased likelihood of at-risk gambling in young adulthood = at-risk gambling during adolescence, being male, delinquency, problem gambling during adolescence, substance abuse, early onset - Factors assoc. with incr. likelihood of problem gambling young adulthood = parental history, problem gambling during adol., substance abuse, and poorer school performance
Slutske, Jackson, & Sher, [In Press]	The natural history of problem gambling with age	N = 468 18-19 yr. Olds first-time freshmen; 393 participants at year 11	<ul style="list-style-type: none"> - 11-year, four-wave longitudinal study spanning ages 18 –29 - Participants part of a longitudinal study of development of alcohol use patterns (Sher et al., 1991) - m= lifetime and past-year involvement in 10 different gambling activities assessed at year 11 → derived measures of gambling versatility and gambling intensity ; DIS used at each wave; 8-item gambling symptoms set 	<ul style="list-style-type: none"> - Past-year prevalence stable at 2-3%; 3-4 year incidence 1-2%; lifetime prevalences of problem gambling from adolescence through young adulthood 3-5% - problem gambling more transitory and episodic than enduring and chronic at the individual level - Consistent with previous research suggesting that natural recovery may be the rule rather than the exception.

MENTAL HEALTH

<u>Study</u>	<u>Focus</u>	<u>Population</u>	<u>Design</u>	<u>Key Findings</u>
Almqvist, 1986	Sex differences adolescent psychopathology	6,482 adolescents birth year 1955	-mental health and psychiatric symptomatology are checked by a questionnaire; male and female data analysed separately.	-Major sex differences in the pattern of psychopathology in adolescence. These differences are complex and seem related to sex role expectations among parents, adolescents and mental health professionals, & to social factors & the changes experienced in life.
Almqvist, 1988 -S. and A. Gyllenberg Foundation	Mental health, social adjustment and childhood antecedents	Children born in Helsinki 1955 (n=6789), childhood and adolescence	-prospective follow-up used data from registers and institutions -hypothesized model for interaction between childhood antecedents and outcome in adolescence	-Psychiatric illness, school problems and drawbacks in social and family life predict disturbance in later life.
Banks, 1988	Employment and training initiatives; locus of control orientation	4798 fifth formers in 1986/87; fifth formers two years previous	-ESRC 16-19 Initiative- completed postal questionnaires on three occasions over a two-year period. Focus on economic and political socialization.	-Differences according to area of residence. High commitment to employment expressed. Success but not failure is more likely to be attributed to individual characteristics such as ability.
Fergusson, Horwood, & Lynskey 1994 -Health Research Council of NZ, National Child Health Research Foundation, Canterbury Medical Research Foundation	Multiple problem behavior in adolescents; childhood history	942 New Zealand children studied at birth, 4 months, 1 year, every year up to age 15	- latent class analysis of data from Christchurch Health and Development Study.	-This group was characterized by conduct disorder, police contact, substance abuse behaviors, early onset sexual activity, suicidal ideation, mood disorders and lowered self-esteem. Many were the offspring of seriously disadvantaged, dysfunctional and disorganized home environments.

Fergusson, Horwood, & Lynskey 1994 -Health Research Council of NZ, National Child Health Research Foundation	Parental separation, adolescent psychopathology, problem behaviors	935 children at age 15 years studied at birth, 4 months, 1 year, and every year up to age 15	-data from Christchurch Health and Development Study. Administered Revised Behavior Problem Checklist, the Diagnostic Interview Schedule for Children, and the Self-Report Early Delinquency Scale. DSM-III-R diagnoses constructed. Optimal informant method and latent class analysis.	-Children exposed to parental separation during childhood had elevated risks of a range of adolescent problems. However, adjustment for confounding factors explained a large amount of the increased risks of adolescent disorder.
Stanger, Achenbach, & Verhulst, 1994 NIMH; Sophia Found'n for Medical Research; Dutch Nat'l Programme for Stimulation of Health Research; U. Associates in Psychi.	Accelerated longitudinal research on child psychopathology	7 cohorts of Dutch children assessed 5 times at 2 yr intervals	-matched individual subjects from different cohorts on Child Behavior Checklist total problem scores at 2 ages.	-Over 2-, 4-, and 6-year intervals, between cohort correlations were nearly as high as within-cohort correlations. However, between-cohort correlations were only similar to within-cohort correlations when they included at least 1 of the 2 ages at which subjects were matched. The results support accelerated longitudinal analysis as a method of combining short-term longitudinal studies of behavioral-emotional problems into a longer longitudinal study.
Werner, 1994 -Foundation for Child Development; William T. Grant Foundation	Effects of perinatal stress, chronic poverty and troubled family environment	698 babies born in 1955 on Hawaiian island of Kauai, to ages 1, 2, 10, 18, and 32 years	-prospective study assessed the long-term consequences of perinatal complications and adverse rearing conditions on the individuals' development and adaptation to life.	-Several clusters of protective factors and processes were identified that enabled most of these high-risk individuals to become competent and caring adults.
Achenbach, Howell, McConaughy, Stanger et al. 1995	Six-year predictors of problems	2,734 children 4 – 26 yrs, reassessed 3 and 6 years later	-parent, teacher, and self-reports on the Child Behavior Checklist and the Youth Self Report Profile	-Similar trait-like patterns for Aggressive Behavior in both sexes; Delinquent Behavior was less trait-like, w/ greater sex differences; Attention Problems syndrome was developmentally stable but associated w/ more diverse difficulties among girls; Anxious/Depressed among boys.

Ferdinand, Verhulst, & Wiznitzer, 1995 -Dutch National Fund for Mental Health; Sophia Foundation for Medical Research	Behavioral and emotional problems from adolescence into young adulthood	N=364 aged 15 to 18 at beginning of study	-Youth Self-Report administered first time. - Young Adult Self-Report administered 2 and 4 years later	-Almost 40% of the adolescents who were classified as deviant initially were still deviant 4 years later. There was no significant difference in the continuity of internalizing problems versus externalizing problems in this sample.
Jacobson & Rowe, 1999	family connectedness, school connectedness, adolescent depressed mood	2302 sibling pairs, mean age=16	-data from National Longitudinal Study of Adolescent Health. Measures: depressed mood, family connectedness, school connectedness, coefficient of genetic relatedness. Structural equation modeling program was used	-Genetic contributions to variation in all 3 variables were greater among female adolescents than male adolescents, especially for depressed mood.
Nader et al, 1999 -National Heart, Lung, and Blood Institute; National Institutes for Health	Diet, physical activity, and related health indicators of students in the CATCH	3714 grade 6,7, 8 students from CATCH- Child and Adolescent Trial for Cardiovascular Health	-follow-up of the 4-center, randomized, controlled field trial with 56 intervention and 40 control elementary schools. 24-hour dietary recall interview, Food Checklist, Self-Administered Physical Activity Checklist, Health Behavior Survey, physiological variables.	-Behavior changes initiated during the elementary school years persisted to early adolescence for self-reported dietary and physical activity behaviors.
Sieving, Perry, & Williams, 1999 -National Institute on Alcohol Abuse & Alcoholism	Peer influence and peer selection	N=1804 adolescents grades 7, 8, 9	-data from Project Northland self-report survey instrument. Latent variable structural equation modeling	-Higher levels of friends' drug use led to increased participant alcohol use. The reverse-order relationship was not supported.
Buchanan, Ten Brinke, & Flouri 2000 -Joseph Rowntree Foundation	Parental background and context with psychological problems	8441 cohort members at age 16 and 33	- Used data from National Child Development study. - Rutter A Health and Behavior checklist used to assess maladjustment, and the Malaise inventory to assess psychological distress	-Restructuring parenting was not a risk factor for maladjustment at age 16. A childhood experience of care or social disadvantage was significantly related to psychosocial problems at age 16. A childhood experience of care was associated with a tendency to adult

				psychological distress in men, as was growing up with a single parent.
Sher, Bartholow, & Wood, 2000	Examination of the predictive utility of the Tridimensional Personality Questionnaire (TPQ) & Eysenck Personality Questionnaire (EPQ) for substance use disorder	N = 489 at baseline; N = 457 at follow-up	Follow-up 6 years later (both a cross-sectional and longitudinal design) - Given the TPQ and EPQ and assessed via a structured interview at baseline and at 6 years	<ul style="list-style-type: none"> - Both the EPQ and TPQ scales demonstrated bivariate cross-sectional and prospective associations with substance use disorders - Those dimensions marking a broad impulsive sensation-seeking or behavioral disinhibition trait were the best predictors prospectively, although the 2 systems were differentially sensitive to specific diagnoses.
Warshaw, Dolan, Keller, 2000	Examine predictors of suicidal behavior	N = 498 patients with panic disorder	Followed for 5 years - Survival analysis used to examine variables correlated with prospectively observed suicidal behavior	-Affective disorders, substance abuse, eating disorders, personality disorders, and being female were risk factors; panic disorder not associated with suicidal behavior in the absence of other risk factors

Aldwin et al., 2001	Examined Individual differences in physical and psychological health trajectories in men	N = 1515 men, - Mean age at baseline 47 years; Average follow-up was 18.55 years	- Sample from the Normative Aging Study - Both linear and nonlinear growth curves were estimated with random-effects models and then clustered to identify patterns of change	- Men whose physical health trajectories were characterized by high, increasing symptoms were higher in hostility and anxiety, were overweight, and smoked - Those whose trajectories were characterized by low symptoms were emotionally stable, educated, nonsmokers, and thin
Bovasso, 2001	Comorbidity of psychiatric disorders and substance abuse on treatment outcomes	N = 1920, participants in the Baltimore Epidemiologic Catchment Area (randomly sampled)	- Followed for nearly 15 years - Measures: Diagnostic Interview Schedule (DIS) to assess symptoms of DSM; occurrence of stressful events; 20-item version of Goldberg's General Health Questionnaire to assess distress	Outcome dependent on whether or not report anxiety or depression at baseline (incr. distress at follow-up), received mental health treatment (decr. distress at follow-up), etc.
Millman, 2001	- Whether help-seeking was associated with impaired mental health - Whether 1954 mental health status predicted health seeking between 1954-1974 - Whether the association of mental health status and help-seeking varied when biosocial characteristics of help-seeking varied	N = 695, respondents from the Midtown Manhattan Study	- Interviews in both 1954 and 1974 - Regression-based measure of mental health status used	- Parental socioeconomic status unequivocally predicted help-seeking - Age, gender, adult SES and impaired mental health in 1954 predicted help-seeking interactively - Mental health of help-seekers continued to worsen and be unfavorable from 1954 to 1974
Prior et al., 2001	Identify predictors of psychological disorder at 11-12 years of age	N = 300, children - Children who scored in the at-risk range for psychological disorder from the	Longitudinal data gathered from infancy to 12 years of age – data from the Australian Temperament Project - analysis of group data focussed on parent and teacher reports on child temperament and behavior, and various	- Strongest predictors of adjustment at 12 years were previous behavior problems, and some specific temperament factors involving self-regulation capacities and mother's overall rating of child difficulty

		Australian Temperament Project	facets of home and school adjustment	
Van Os, Park & Jones, 2001	Examine association between cognitive ability, neuroticism, and mental ill-health is driven in part by a predisposition to experience depressogenic stressful life events	N = 5,362 Birth cohort	<ul style="list-style-type: none"> - Measures of cognitive ability and neuroticism in childhood - At ages 36 and 43 mental state and occurrences of Stressful Life Events measured - compared models using path-analytic approach 	- Results congruent with suggestion that genetic effects on SLEs are mediated by personal characteristics
Wetherell, Gatz & Pedersen, 2001	Modeled anxiety and depression symptom data	N = 1391 Participants in a longitudinal study of Swedish twins (middle-aged and older)	<p>Longitudinal – over 6 years (2 three year intervals)</p> <ul style="list-style-type: none"> -anxiety and depression highly correlated – but a model with distinct Anxiety and Depression factors fit data better than models with Positive and Negative Affect factors or a single mental health factor 	<ul style="list-style-type: none"> - Over the 2 3year intervals, anxiety symptoms led to depressive symptoms, but the relationship is not reciprocal -Anxiety symptoms were more stable than depression - Anxiety symptoms may reflect personality traits more than depression does
Woodward & Fergusson, 2001	Examined the associations between the extent of anxiety disorder in adolescence and young people's later risks of a range of mental health, educational, and social role outcomes	N = 1265 Birth cohort of New Zealand children	<ul style="list-style-type: none"> - Longitudinal study of 21 years - Measures incl: 1) assessment of DSM-III-R anxiety disorders between 14-16 years; 2) assessments of mental health, educational achievement, and social functioning between ages 16-21 years; 3) measures of potentially confounding social, family, and individual factors 	- Significant associations between number of anxiety disorders reported in adolescence and later risks for: anxiety disorder, major depression, nicotine, alcohol and illicit drug use, suicidal behavior, educational underachievement, and early parenthood
Fergusson & Horwood, 2002	Examine the extent to which young people with depression in mid adolescence were at increased risk of	N = 1265 children	<p>Followed the birth cohort for 21 years</p> <ul style="list-style-type: none"> - Measures: DSM-III-R, major depression (at 14-16 yrs.), psychiatric disorders, educational achievement, and social functioning (at 16-21 years), social, familial, and individual factors, 	- Young people with depression in adolescence were at significantly higher risk of later major depression, anxiety disorders, nicotine dependence, alcohol abuse or dependence, suicide attempt, educational underachievement, unemployment, and

	adverse psychological outcomes in later adolescence and young adulthood		and comorbid disorders)	early parenthood
Maser et al., 2002	Suicide in affectively ill patients	N = 529; aged 17 and older - sample of depressed patients collected by the National Institute of Mental Health Collaborative Depression Study	- Followed naturalistically for up to 14 years - compared on clinical and intake personality - Groups: Suicide completers, serious suicide attempters, and no-suicide attempt comparison group - Patients completed a self-report battery comprised of 436 items (primarily personality scales)	- Completers and attempters(though similar in many ways) had differentiating characteristics - Suicide completed within 12 mos. was predicted by clinical but not personality variables - Suicide beyond 12 mos. Was predicted by derived temperament factors, not clinical variables - Impulsivity a major characteristic of suicide completers – high in both attempters and completers

SOCIAL SCIENCES

<u>STUDY</u>	<u>FOCUS</u>	<u>POPULATION</u>	<u>DESIGN</u>	<u>KEY FINDINGS</u>
Newcomb & Bentler, 1986	Changes and sequencing of drug use from adolescence to young adulthood	N = 654	<ul style="list-style-type: none"> - Longitudinal: 8 years (3 wave – yr 1,) - Subjects first contacted when in 7th, 8th, and 9th grade students enrolled in 11 LA County schools 	<ul style="list-style-type: none"> - Large # of early experimental cigarette and alcohol users but in adolescence/late adolescence it dropped to consistent users (cigarette), though alcohol had significant incr. in young adulthood. - Hard drugs incr. significantly over the eight year period - Cigarette use predicted later cigarette, cannabis, and hard drug use; alcohol predicted later non-subscription drug use; cannabis led to later cigarette and hard drug use.
Ghodsian & Power, 1987	Relationships between consumption & other factors at age 16 to alcohol consumption at age 23	N = 16,457	<ul style="list-style-type: none"> - Longitudinal data over 16 years (age 7, 11, 16, & 23) - Data from the National Development Study (England, Scotland, Wales births in 1958) 	<ul style="list-style-type: none"> - Significant association between frequency of drinking at age 16 & 23; alcohol consumption at age 23 correlated with place of drinking at age 16 (public houses) - A greater % of women compared to men did not drink at all or only on special occasions, and a lower % of women than men who were medium or heavy drinkers
Dontas, Tzonou, Kasviki-Charvati, Georgiades, Christakis, & Trichopoulos, 1991	Factors that effect relative mortality rate ratios in a residential-home aged population	N = 408 (141 males, 267 females)	<ul style="list-style-type: none"> - Longitudinal: 1978/1983 – 1988 - Participants from the Athens Home for the Aged, adequately mobile and have no chronic disease 	<ul style="list-style-type: none"> - Factors associated with shorter survival: higher age, ECG abnormalities, cigarette smoking, mild mobility impairment at entry
Dobkin, Tremblay, Masse, & Vitaro, 1995	Variables that predict substance abuse in boys of low SES at age 13	N = 755 - all male, Caucasians, low SES	<ul style="list-style-type: none"> - Longitudinal: 6-7 years (Start: kindergarten; Finish: Age 13) - study tested 3 competing models regarding future substance abuse - Measures: Social Behavior questionnaire (teachers), peer 	<ul style="list-style-type: none"> - Individual characteristics are better predictors of substance abuse than peer or mutual friend characteristics

			assessments, drug/alcohol use and friend delinquency	
Farrinon, 1995	Factors that predict development of offending and antisocial behavior	N = 411, boys aged 8-9 (w/in 1 mile radius of research office)	<ul style="list-style-type: none"> - Longitudinal: participants tracked from age 8 till 32 (24 years) - Participants first contacted in 1961-1967 - Measures: intelligence, attainment, personality, psychomotor impulsivity, living circumstances, employment histories, rel. w/ females, drinking, drug use, fighting, and offending behaviors 	<ul style="list-style-type: none"> - Factors at age 8 that predicted future delinquency: antisocial child behaviors, low intelligence and attainment, family criminality, impulsivity, and poor parental child rearing behavior - Marriage, employment, and leaving London areas decreased the likelihood of criminal behaviors
Fawer, Besnier, Forcada, Buclin, & Calame, 1995	Factors (perinatal, developmental, & environmental) that influence cognitive abilities of preterm children 5 years later	N = 252, preterm infants (between 1982 and 1986)	<ul style="list-style-type: none"> Longitudinal: Preterm infant followed until age 5 - Looked at perinatal factors, developmental factors and environmental factors; outcome parameters = major impairments, neurological anomalies, and cognitive abilities (using McCarthy Scale of Children's Abilities and General Intellectual Index) 	<ul style="list-style-type: none"> - At age 5, 252 had major impairments. - Cognitive abilities of lower and middle SES lower than those of upper SES. - Factors with main influence on cognitive ability: gestational age & mechanical ventilation (positive correlation); negative effect – dystonia, bilingualism, & lower SES
Kubicka, Csemy, & Kozeng, 1995	Drinking habit changes (and reasons) after major sociopolitical change in Prague	N = 608, women aged 20-49 (representative probability sample)	<ul style="list-style-type: none"> Longitudinal: 5 years (1st wave: 1987; 2nd wave: 1992) - Measures: Interviews in 1987 and 1992 (both years: alcohol use, its context and correlates; 1992: attitudes to sociopol. events and stressful life events); 2 self-administered questionnaires (Attitudes to Drinking and Mood Frequency), social desirability score 	<ul style="list-style-type: none"> - Tolerance of drinking to intoxication incr. markedly, acceptance of drinking in order to relieve stress incr. - Positively correlated to consumption of alcohol: employment status, age - Those who expressed that the new politics of the country incr. social contacts and had a positive impact on personal life were more likely to increase consumption

Seeman & Lewis, 1995	Relationship between powerlessness, health and mortality	N = 2,830 men; 3,534 women - 1 st interview when male Ss aged 45-59 and females aged 30-44	<ul style="list-style-type: none"> - Longitudinal: 5 years - Subjects from the National Longitudinal Surveys conducted by the U.S. dept. of labor - Instruments include Rotter I-E measure of internal vs. external control, health measures - Using multivariate and cross-time analysis 	<ul style="list-style-type: none"> - Initial health was best predictor for activity limits 5 years later and increased psychosocial symptoms - Increased powerlessness predicts increased health problems - Early powerlessness predicts later activity limits and psychosocial symptoms
Akers & Lee, 1996	Test Social Learning Theory as it relates to smoking in adolescents	N = approx. 2000 for each of the 5 years of study	Longitudinal – a sample of approx. 2000 was taken every year for 5 years, including students who had participated in one or more years previously, new respondents in the 7 th Grade, and new students coming into any grade who had not taken part previously	- The Social Learning Theory affected smoking over time
Alexander, Entwisle, & Dauber, 1996	Movement of children to new schools and the consequences of this mobility on children's school performance	N = 568 (Original sample – Grade 1 students)	<ul style="list-style-type: none"> Longitudinal: 5 years - Beginning School Study in Baltimore in 1982 and provided a two stage stratified sample 	- More moves were associated with lower test scores, lower marks, receipt of special education services, and higher likelihood of retention. mobility had more adverse effects on academic accomplishments for high SES children.
Beitchman et al., 1996	Speech/language impairment at age 5 effects psychiatric status at age 12.5	N = 202 (91 impaired, 111 control)	<ul style="list-style-type: none"> Longitudinal: 7 years -Participants from a 1-in-3 random sample in Ontario, included those that failed the speech/language impairment screening 	- Children at age 5 with S/L impairment more likely to be assessed with psychiatric disorders at age 12.5 than controls, even if S/L had improved
Fergusson & Lynskey, 1996	Factors that effect the resiliency of youth with a disadvantaged history	N ~ 1000; NZ children	<ul style="list-style-type: none"> Longitudinal: 16 years (birth, 4 mos, 1 year, and annually till age 16) - Subjects from birth cohort from Christchurch, NZ 	- 63 of the 171 high-risk youth had no externalizing problems (resilient): higher IQ and self-esteem, lower attention-deficit and conduct disorder behaviors, lower novelty seeking, enjoyed high school more, higher levels of parental care and parental attachment but lower levels of maternal over protection, and fewer affiliations with delinquent peers

Kaskutas, Weisner, & Caetano, 1997	Predictors of help-seeking behavior for alcohol related problems among the general population	N = 2,234 (Whites, Blacks, Hispanics)	<p>Longitudinal: 1984 to 1992 (8 years)</p> <ul style="list-style-type: none"> - Subjects selected from a "multi-stage area probability sample of 5,221 adults" from which 3,236 were selected for re-interview in 1992 based on drinking patterns and history - Predictor variables: demographic variables/characteristics & alcohol related variables. - Data analysis: logistic regression 	- One was more likely to seek help for alcohol-related problems if they were men, less than 40 years old, and Hispanic
Kiernan, 1997	Social, economic and educational predictors of becoming a young parent	<p>N = 4267 women, 3495 men</p> <p>-Original sample 17,414 who were followed up at ages 7, 11, 16, 25 & 33</p>	<p>-Longitudinal data from the National Child Development Study (NCDS)</p> <p>-Collected information from children in England and Wales who were born in 1st week of March 1958</p> <p>Measures: 3 measures of family's SES; education standardized tests; emotional development rated by parents and teachers; Rutter Home Behavior Scale; teachers completed the Bristol Social Behavior Scale</p>	- Early parents more likely to from the lower half of the cognitive distribution, had low scores on the emotional index, whose families had experienced financial difficulty, whose mothers were early parents, and wanted a child or family at an early age.
Lindahl, Clements, & Markman, 1997	Effect of marital quality before parenthood is related to affective quality of parenting in mother- & father-child relationships	N = 25 couples; at least one child each	<p>Longitudinal: 5 years</p> <ul style="list-style-type: none"> - Participants recruited from a longitudinal study that began in 1980-81 - Measures incl: self-report MAT (with and without child) and marital communication (IDCS) 	<ul style="list-style-type: none"> - Marriage quality before birth significantly predicted later mother-father interactions that children witness; but parent-child interaction unaffected when current factors considered - Men more likely to lack negative affect regulation in front of children
Stattin, Romelsjo & Stenbacks, 1997	Late adolescence personal resources as protective factors, and their relationship with future criminality	N = 7,577 original sample: 18-20 yr old males entering compulsory military services	<ul style="list-style-type: none"> - Longitudinal: followed up until 36 years old - Measures: Personal resources; Behavioral Risk Factors; Unfavorable upbringing conditions 	- Subjects with several documented high resources had a lower frequency of criminality than subjects with no or few competencies.

Asikainen, Kaste, & Sarna, 1998	Long-term outcome of traumatic brain injury patients	N = 496; aged .8 – 71 years old	Longitudinal: 5 to over 20 years - Used 3 variables felt would predict long-term outcomes of patients: Glasgow Coma Scale, Length of Coma, & Post Traumatic Amnesia	- Coma Scale score on hospital admission during acute phase correlated to functional outcome - Length of coma and posttraumatic amnesia correlate with patient's work history and functional outcome; age of injury also related to follow-up outcome.
Fergusson & Horwood, 1998	Relationship between childhood exposure to parental violence and psychosocial adjustment in young adulthood	N = 1025 - Subjects from the Christchurch Health and Development Study (CHDS) from 1977	- Cohort study - CHDS studied children at birth, 4 months, 1 year and annual interviews till age 16, and at age 18 - Using retrospective reports of witnessing interparental violence - Measures include composite International Diagnostic Interview; Self-report Delinquency Inventory; Conflict Tactics Scale (at age 18)	- When confounding variables controlled, father-initiated violence was highly correlated with child's conduct disorder, anxiety disorder, and property offending; - Mother-initiated violence was associated with child's risk of later alcohol use or dependence
Levin & Taylor, 1998	Examine the effects of religious involvement on well-being in a sample of African Americans	N = 1,988 (T1); 601 (T2); and 582 for wave I-IV panel analysis Using the National Survey of Black Americans	Wave I – 1979-980 Wave IV – 1992 - Measures: 12 endogenous factors (grouped as religiosity, well-being, and health satisfaction – including a 10-item version of the RAND Mental Health Index) and 7 sociodemographic factors - Data analyzed in order to compare contemporaneous and longitudinal effects of 8 religiosity measures on 3 well-being indicators	- Religious effects on well-being were present at both waves for nearly every combination run - Longitudinal effects were only significant using bivariate analyses (controlling for other variables rendered and longitudinal effects insignificant)
Pagani, Tremblay & Vitaro, 1998	Preschool intervention as a moderator of perinatal complication effects on boys' risk of early delinquency	N = 404 male children, French-speaking, low SES	- One group experienced the preschool program (N = 117) while another did not (N = 287) - Measures include: Initial completion of social Behaviour Questionnaire at age 6, and annually from ages 10-15; self-report delinquency scale at age 11&12; perinatal complete history	- Preschool benefited only those boys who did not have any perinatal problems

Argue, Johnson, & White, 1999	Effects of age, time period, and family life course events on religiosity	N = 1339 (age 18-55 time 1)	Longitudinal: 12-year - Subjects from the Marital Instability over the Life Course study in which random digit dialing was used to select the sample in the USA	- Age and religious influence on daily life are positively correlated; effect of age nearly doubles when time period effects are controlled. - Effect of age was the significant variable in changes in religiosity with some life course events slightly influencing changes (though not significant)
Bergmark & Anderson, 1999	Examine early risk factors and the development of drinking habits	N = 547 girls; N = 541 boys Swedish adolescents	Information from the Individual Development and Adaptation research program that began in 1965 and collected data from children when 10,13,15, and 16 years old	- Factors that predict increased drinking in adolescent boys: unstable social background, unsatisfactory school situation, display of conduct problems, low compliance with parents, and rich social life - In girls: rich social life, deficient school adaptation, discernable conduct problems, and problematic family background
Blane, Harding & Rosato, 1999	Examine the socioeconomic mortality differential as it relates to changes in social class	N = 46,980 men and women who were aged 35-54 in 1971 and whose social class info was available in 1981 and mortality info in 1992	1971 - 1981 (social class) - 1992 (mortality) Subjects from the Office for National Statistics Longitudinal Study (population sample in England and Wales)	- Downwardly mobile individuals were at higher risk for mortality than those they left behind but were lower risk than those in their class of destination - Upwardly mobile subjects at lower risk for mortality than those they left behind, but at higher risk than those in their class of destination
De Li. , 1999	Legal sanction effects on juvenile life chances and status achievement	N = 389, London working-class boys (Age range from 8-32 during course of the study)	-Longitudinal: Interviewed 8 times in 24 years. - Focus on 3 sets of variables: delinquency variables, status achievement variables, and social control variables - used "structural equation model" permitting testing of different clusters of variables to see how they determine the "process of delinquency and status achievement"	- Legal sanctions in early childhood increase delinquency and antisocial behavior while they decrease later life chances.

Lewis, Ross & Mirowsky, 1999	Factors effecting sense of control over one's life; and whether it develops during adolescence – adulthood transition	N = 8,247 Age 14-22 in 1979; aged 27-35 in 1992	-Subjects from the National Longitudinal Survey of Youth. Original data from 1979, re-interviewed in 1992 - Measures: For Perceived Personal Control in 1979 used one based on Rotter's (1966) vs. 1992 used the Pearlin et al. (1981) scale	- Non-marital pregnancy doesn't directly suppress the development of personal sense of control in adulthood, but dropping out of school does - Subjects with well-educated parents and those with high cognitive skills as teenagers had higher perceived sense of control
Johnson & Pandina, 2000	Relationship between alcohol use, gender, stress, and coping	N = 411, sample from the Rutgers Health & Human Development Project, - 12 years old at initial testing	- Subjects followed from age 12 to 25 (4 wave: aged 12, 15, 18, & 25) - Measures: Perceived Personal control used in 1979 based on Rotter's scale; Perceived Personal control used in 1992 based on Pearlin et al. (1981) scale - Recorded the stability and change in 4 types of stress and 5 coping methods over time and examine gender diffs - sample weighting used; cross-sectional analysis, longitudinal analysis, and reflexive analysis	- Stress and coping did not differ between non-problem and problem users at 15 yrs., except female dependent users drank alcohol and relied upon emotional coping at high levels at age 15 - Males consumed more alcohol and reported more alcohol-related problems; and more likely at T4 to be categorized as dependent or abuser.
McGee & Williams, 2000	Examines the predictive association between both global and academic self-esteem to a variety of health-compromising behaviors at a later age	A large sample of young New Zealanders	Longitudinal study - Global and predictive self-esteem at age 9 to 13 -Health-compromising behaviors at age 15 (over 6 year period)	- Levels of global self-esteem significantly predicted adolescent report of problem-eating, suicidal ideation, and multiple health compromising behaviors - Earlier levels of self-esteem were unrelated to later substance use and early sexual activity
Monks, 2000	Examine the connection between public or private educational institutions and their Carnegie Classification on the monetary	N = 12,687 Subjects selected from the National Longitudinal Survey of Youth in 1979 when ages 14-22 and	Followed over a 14 year period - Measures: highest amount of education, hourly wages (b/w \$2.93 & \$500), institution classification (private of public), college quality & competitiveness	- College quality and reputation was positively correlated with higher earnings - Graduates from graduate degree granting and research institutions were significantly more likely to have higher earnings than those who graduated from liberal arts colleges

	earnings of their graduates	in 1993 when ages 28-36		
Nordstrom, Kimmen, Utman, Krall, Vokonas, & Garvey, 2000	Risk factors for the long-term continuation of smoking	N = 986, participants selected from the ongoing normative aging study	<ul style="list-style-type: none"> - Longitudinal: all participants interviewed 3 to 5 years after baseline; 25 year follow-up - Measure: Horn Waingrow reasons for smoking scale 	- Baseline cigarette consumption and age were significant predictors of continued long-term smoking status (younger men and heavy smokers more likely to continue smoking)
Celentano et al., 2001	Investigated the dynamic nature of HIV behavioral risk factors between 1988 and 1994	N = 2,960 injection drug users	<ul style="list-style-type: none"> - A 6 year prospective study - Behavioral risks assessed semi-annually - Robust regression models of time-dependent co-variables were used to identify longitudinal predictors of behavior change 	<ul style="list-style-type: none"> - Risk reduction seen more in HIV-infected participants than among HIV seronegatives - Those at highest risk for HIV were least likely to cease engaging in these behaviors
Ellickson, Tucker & Klein, 2001	Compare grade 7 nonsmokers, smokers, and experimenters on the basis of other problem behaviors at grade 7 & 12	N = 4327, California and Oregon students; grouped into nonsmokers, smokers, and experimenters	<p>Longitudinal self-report data from grade 7 & 12</p> <ul style="list-style-type: none"> - used logistic regression to develop weighted estimates of the prevalence of academic difficulties, substance use, and delinquent behaviors - Huber variance estimates used to assess the statistical significance of differences across the groups 	<ul style="list-style-type: none"> - Early smokers 3 times more likely by gr12 to regularly use tobacco and marijuana, hard drugs, sell drugs, have multiple drug problems, drop out of school, and experience early pregnancy and parenthood, lower academic achievement, more behavior problems in school/stealing/other delinquent behaviors - Early experimenters also at risk for all the above, though to a lesser extent than smokers
Fergusson, Horwood, & Woodward, 2001	Relationship between unemployment following school leaving and psychosocial adjustment	N = 1265; New Zealand born birth cohort of urban youth	<p>Longitudinal: Studied from birth to age 21</p> <ul style="list-style-type: none"> - Data gathered during the course of the Christchurch Health and Development Study - Info gathered by personal interview on 1) exposure to unemployment and 2) personal adjustment over ages 16-21 (including mental health, substance 	-Exposure to unemployment remained significantly associated with suicidal ideation, substance abuse, and criminal behavior

			use, crime, suicidal behaviors, and teenage pregnancy	
Galaif et al., 2001	Influence of family factors and childhood maltreatment in the predictor of alcohol abuse in adulthood + gender differences	N = 426 – community sample (305 females)	Three time periods (childhood to adulthood): childhood plus two later points in time	<ul style="list-style-type: none"> - Significant relationships between family processes, childhood maltreatment, and problem alcohol use within time and longitudinally for both men and women - Significant relationship between childhood abuse and later alcohol-related problems - Parental drug use related to problem alcohol use in adulthood
Ostir, 2001	Examined the longitudinal relationship between emotional well-being and subsequent health	N = 4162 North Carolinans (1901 non-Hispanics, 2261 blacks) N = 3050 Mexican Americans	<p>Data from the Established Populations for Epidemiological Study of the Elderly – individuals aged 65 or older</p> <ul style="list-style-type: none"> - Longitudinal 5-6 year follow-up period depending on race (and at multiple points in time) - Measures: CES-D scale (baseline emotional well-being), positive and negative affect scales, functional ability and mortality 	<ul style="list-style-type: none"> - Pre-morbid emotional well-being is predictive of Activities of Daily Living disability for non-Hispanic whites, blacks, and Mexican Americans - Emotional well-being can effect subsequent health of the older individual and can affect recovery from acute disease
Rutledge & Sher, 2001	Relationship between stress and heavy drinking across late adolescence and early young adulthood	N = 485 (255 women) - participants at each of the years were included only if data available on the frequency of their heavy drinking & if completed the Eysenck Personality Questionnaire	<p>Five wave longitudinal design over 7 years (years 1, 2, 3, 4 and 7) of an ongoing longitudinal study of 489 young adults with negative and positive family histories of alcoholism (Sher et al., 1991)</p> <ul style="list-style-type: none"> - negative life events or emotional distress (effects on heavy drinking of stress), tension-reduction drinking motives, gender, & personality analyzed each year with hierarchical multiple regression 	<ul style="list-style-type: none"> - Stress positively related to heavy drinking, but only for men with stronger tension-reduction drinking motives at year 4 (age 21) - Relationship b/w tension-reduction drinking motives and heavy drinking was positive, developmentally graded, and moderated by gender

		at Year 1		
Weiner et al., 2001	Relationship between alcohol use in early adolescence to anger in late adolescence	N = 1201 students from Indiana; (50% female; 75% white; 69% low SES)	Data collected from 1987-1993 as part of a large drug abuse prevention trial -Measures: 4 anger-related questions; 2 questions asking subjects to report the number of alcoholic drinks consumed and drunkenness in past 30 days - Odds ratios used to assess the predictive relationship of alcohol use early adolescence to anger in late adolescence	- Early use of alcohol increased the odds of later anger – both in middle and late adolescence (controlling for gender, age, and SES). - Findings suggest alcohol and drug abuse prevention programs in early adolescence may be especially useful
Wolock, Sherman, Feldman, & Metzger, 2001	Investigate the interrelated problems of the high rate of repeated reports and unsubstantiated cases encountered by child protective services	Data drawn from 238 families – tracked from their first report through June 1996	Examined over a 5 year period - paired comparisons of the unsubstantiated cases, substantiated re-reports, and no further reports -Suggest implications for resource capacity of child protective services	- Average family was reported just over four times over a 5 year period; slightly more than a third of family's reports were substantiated - Predictors of the number of subsequent reports: poorer family functioning, parental substance abuse, receipt of Aid to Families with Dependent children, and number of children
Garnier & Stein, 2002	Examination of the interrelationship of family and peer experiences in predicting adolescent problem behaviors	N = 198, adolescents from conventional and nonconventional families	18 year longitudinal study - Extensive interviews, questionnaires, home observations, staff ratings, and clinical assessments were used to collect 15 waves of data on families and their children - Measures: Face-to-face interviews and questionnaires beginning at last trimester of pregnancy through 18 years used to obtain data on family background, values, and drug use from mothers. Questionnaires were used at 18 years to obtain adolescent reports of their values, behaviors, and perceived peer behaviors. Teachers rated children's competencies in Grades 1 and 2	- Similar behavior by peers was the most powerful predictor of teen drug use and delinquent behavior - Strong peer effects in adolescence reflect even earlier processes in childhood and highlight the importance of linkages from early childhood experiences in family and peer contexts to the development of adolescent problem behaviors

Lavoie et al., 2002	Family dysfunction and perpetuation of dating violence by adolescent boys	N = 717; boys beginning at age 10	<ul style="list-style-type: none"> - Longitudinal study of 8 years; data collected at 6 time periods (beginning at age 10) - 15 years: delinquency measured; 16&17 years perpetuated psychological and physical abuse in dating - All measures self-report questionnaires - Utilized multiple regression analysis 	<ul style="list-style-type: none"> - Boys who perceived laxness of monitoring from parents in late childhood, and reported antisocial behavior at 15 years were at risk - Harsh parenting practices also predictor of dating violence
----------------------------	---	-----------------------------------	---	---

LONGITUDINAL METHODOLOGY

<u>STUDY</u>	<u>FOCUS</u>	<u>DESIGN</u>	<u>KEY FINDINGS</u>
Jorm, Duncan-Jones, Scott, 1989	Analysis of re-test artefact in longitudinal studies of psychiatric symptoms and personality	-data from sample were analyzed to discover under what circumstances the retest artifact occurred.	-retest artifact poses a threat to validity of longitudinal studies. -artifact was confined to measures assessing negative self-characteristics and administered orally by an interviewer
Connolly, 1991	Longitudinal studies of personality, psycho-pathology, social behavior	-organizes and evaluates the longitudinal research on personality involving adults or late adolescents at the initiation of data collection, in the last 30 years.	-studies have made a great deal of progress. Consistency and predictive relationships have firm empirical foundations. Sounder methodology; multi-method assessment is promising
Farrington, 1991 Program on Human Development and Criminal Beh'vr	Advantages, problems, & prospects of longitudinal research strategies	-reviews the distinctive advantages of longitudinal vs. cross-sectional research -outlines the problems of the traditional single-cohort, long-term prospective longitudinal survey ----suggests the use of a multiple-cohort sequential strategy as a way of achieving the benefits of the longitudinal methods while minimizing problems	-the single-cohort, long-term longitudinal survey has many advantages in comparison with a cross-sectional survey. However, the longitudinal survey also has significant problems -A multiple-cohort sequential strategy may achieve the benefits and minimize the problems
Swaim, 1991 -Tri Ethnic Center for Prevention Research -NIDA	Risk factors for substance abuse	-Reviews theory of research area, the numerous risk factors that predict later substance use	-Outlines theory and schema for predicting substance use -Childhood and adolescent hyperactivity and antisocial behav. predict later substance use -Family mismanagement, parental use, low academic performance/commitment and peer use also predictive -Where, when and how many risk factors influence dev. of substance use
Verhulst & Koot, 1991 Netherlands' Health Research Promotion Pgm	Longitudinal research in child and adolescent psychiatry	-strengths and weaknesses of longitudinal research -factors hampering progress in this field	-the many advantages of this approach warrant continuing efforts to develop strategies that minimize its drawbacks: assessment of developmental changes; determination of timing; escape from adverse events

Edelbrook, C. 1994	Assessing child psychopathology in developmental follow-up		-problems of measurement equivalence in longitudinal studies of psychopathology
Loeber & Farrington, 1994 NIMH; Office of Juvenile Justice and Delinquency Prevention	Problems/solutions in longitudinal & experimental treatment studies of child psychopathology and delinquency	-identifies questions in child psychopathology and delinquency that can best be answered by using longitudinal data -discusses the advantages and problems of longitudinal studies -reviews methodological issues arising in longitudinal research on child psychopathology and proposes solutions to the problems	-more longitudinal studies of child psychopathology including experimental treatment interventions are needed, with repeated data collection from a variety of sources and several years of data before and after the interventions. Such studies are likely to improve the understanding of child psychopathology and of factors that influence and reduce serious outcomes for children & adolescents
Rutter, M. 1994	Developmental psycho-pathology as a research perspective	-limitations of stage theories when studying psychopathology -the need to take into consideration inter-individual differences, continuities, and discontinuities in individual development -implies utilizing longitudinal approaches	
Wierson & Forehand, 1994 William T. Grant Foundation; the Irvine Foundation U. of Georgia's Institute for Behavioral Research	Role of longitudinal data with child psycho-pathology and treatment	-A review of some of the research questions that longitudinal designs can answer and how longitudinal studies have been used in evaluating traditional syndromes in child clinical psychology. -introduces the articles in the special section	-Longitudinal data can play an important role in child psychopathology and treatment. Questions that can be addressed: developmental changes over time; issue of continuity and discontinuity; directionality of prediction and association; treatment outcome; trad'l child clinical syndromes

Newcomb, 1997 -NIDA	Predictors and consequences of drug use	- reviews and outlines main issues, findings, and conclusions of research	-reviews Newcomb's prospective research (16yr study) regarding psychosocial predictors and consequences of drug use -spans child-adolescent-young adult-adult -predictors and consequences vary with developmental stage, use, abuse and dependence -comprehensive outline of factors related to drug use
Boehnke, K. 2000	What is a cohort	- discusses two well-designed studies: the Monitoring the Future Study, and the Iowa Youth and Families Project	-calls for greater cohort or generational sensitivity in youth research -suggests using different conceptualizations of what a cohort could be
DiClemente, Story & Murray, 2000	Adolescent initiation and cessation of problem gambling	- Discusses the pathways, prevention issues, and cessation issues related to adol. gambling	-Examines the pathways and risks for adol. gambling -prevention -Cessation of adol. gambling using the stages of change
Griffiths & Wood, 2000	Risk factors for adolescent gambling	- discusses situational factors, structural characteristics, and risk factors, and future research suggestions	-Situational factors have the most influence on the acquisition of gambling whereas structural characteristics impact the development and maintenance of gambling -Structural characteristics include: short pay-out times, psychological rewards, rapid event frequency, accessibility, etc. -Suggestions for future research and listings of risk factors
Hedeker & Mermelstein, 2000	Analysis of longitudinal substance use outcomes using ordinal RRM	-Describes an ordinal random-effects regression model that includes the possibility that covariate effects vary across the cutpoints of the ordinal outcome. Data from a 15-mo telephone intervention smoking cessation study are used to illustrate application of this model	-advantages: models allow for incomplete data across time, time-invariant and time-varying covariates, and can estimate individual change across time

Boyle & Willms, 2001 CIHR Scientist award; Canadian Institute for Adv. Research; US Spencer Found'n	Multilevel modeling of hierarchical data in developmental studies	-insight into how a multilevel modeling framework can be used in longitudinal studies to assess contextual influences on child development when study samples arise from naturally formed groupings	-discusses the types of variables and research designs used for collecting developmental data -presents the methods and data requirements associated with two statistical approaches -describes the multilevel extensions of these approaches for addressing research questions -demonstrates the flexibility of these two approaches -important issues, alternative approaches, recent developments
Raudenbush, 2001 MacArthur Fdn, Nat'l Institute of Justice; NIMH	Comparing personal trajectories, drawing causal inferences from longitudinal data	-considers statistical analysis of data from longitudinal studies; person-specific models and between-person model= two stage modeling framework; published examples reveal how this approach can be flexibly adapted; problem of drawing causal inferences from repeated measures data	
Steinberg, 2001 MacArthur Fdn Research Network on Psychopathology & Development	Adolescent development	-conclusions and ideas about adolescent development and psychological functioning -adolescent problem behavior, parent-adolescent relations, puberty, the development of the self, peer relations -identifies and examines: research on diverse populations; contextual influences on development, behavioral genetics; siblings	

APPENDIX 2: COMMUNITIES

Note: Bolded indicate communities that will be sampled.

Data from Smith and Wynne (2004). VLT Gambling in Alberta: A preliminary analysis.
Final Report. Edmonton, AB

	Pop.	#VLT machine s	\$/machine	\$/machine/ capita	machines/ capita	Casino	Distance to Casino	Distance to Edmonton, Calgary or Lethbridge
Standoff (Blood)	6,000					NO		
Brocket (Peigan)	2,000					NO		
High Level	3,638	20	201,666	55	1 to 182	NO	453	735
Peace River	6,240	25	149,795	24	1 to 250	NO	200	484
Hanna	3,000	23	69,519	23	1 to 130	NO	140	140
Slave Lake	6,600	32	129,709	20	1 to 206	NO	251	251
Blairmore	4,621	21	91,884	20	1 to 220	NO	140	140
Pincher Creek	3,666	25	61,087	17	1 to 147	NO	103	103
Edson	8,000	41	121,998	15	1 to 195	NO	200	200
Whitecourt	8,000	45	112,170	14	1 to 178	NO	177	177
Lloydminster	13,000	54	142,816	11	1 to 241	NO	251	251
Leduc	15,000	63	144,404	10	1 to 238	NO		
Brooks	11,604	59	112,054	10	1 to 197	NO		
Spruce Grove	16,000	48	126,424	8	1 to 333	NO		
Ft. McMurray	47,000	91	168,829	3.6	1 to 637	YES	0	439
Grande Prairie	37,000	121	88,759	2.4	1 to 306	YES	0	456
Red Deer	70,600	192	104,780	1.5	1 to 368	YES	0	
Medicine Hat	51,200	213	69,894	1.4	1 to 240	YES	0	168
Lethbridge	72,717	191	81,967	1.1	1 to 381	YES	0	0
Edmonton	666,104	1184	105,202	0.2	1 to 563	YES	0	0
Calgary	905,000	1263	114,317	0.1	1 to 717	YES	0	0
Taber	7,000	yes				NO		
Ft. Macleod	3,000	yes				NO	50	50
Nanton	2,000	yes				NO	70	70
Lacombe	10,000	0	0	0	0	NO	30	100
Picture Butte	1,600	0	0	0	0	NO	20	20
Coaldale	6,000	0	0	0	0	NO	15	15
Raymond	3,200	0	0	0	0	NO	30	30
Cardston	3,500	0	0	0	0	NO	80	80

APPENDIX 3: INSTRUMENTS AND INTERVIEW STRUCTURE

ADULT INSTRUMENTATION (shaded sections are repeated each year, white sections will only be included in the first year, green sections will only be included in following years)

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ¹	RELIABILITY	VALIDITY
DEMOGRAPHICS		Demographics	CPGI or GSS ² + religion + collaterals + postal code + SES + family ³	8 min	I, T	NA	NA
RETENTION		Retention	+ e-mail + SIN + driver's licence # + name of high school	10 min	I	NA	NA
GAMBLING	EARLY GAMBLING HISTORY	Gambling involvement	CPGI Q1-30	2 min	S, T	CPGI internal consistency reliability = 0.93	CPGI correlation with DSM-IV = 0.83 ⁴
	MOTIVATION FOR GAMBLING		CPGI	1 min	S, T	CPGI internal consistency reliability = 0.93	CPGI correlation with DSM-IV = 0.83
	PAST YEAR BEHAVIOUR (\$, frequency, time, type, context, big win, big loss, exposure to prevention or treatment; self-report of why their behaviour changed in past year)		CPGI (\$ modified)	20 min	S, T	CPGI internal consistency reliability = 0.93	CPGI correlation with DSM-IV = 0.83
	KNOWLEDGE OF GAMBLING & PROBLEM GAMBLING	Broader Socio-Cultural Factors	Williams' Gambling Knowledge Scale	5 min	S, T		

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ¹	RELIABILITY	VALIDITY
	ATTITUDE TOWARD GAMBLING		Gambling Attitudes Scale Williams Scale + AGLC Hardness of Gambling Scale + selected Canada West Foundation questions	5 min	S, T	Williams Scale: test-retest (6 mo) = .70	Williams Scale: strongest predictor of current gambling behaviour and 6 mo gambling behaviour among all variables ⁵
	PROBLEM & PATHOLOGICAL	Gambling Disorders	CPGI (9 item) CIDI gambling module	10 min	S, T	CPGI internal consistency reliability = 0.93	CPGI correlation with DSM-IV = 0.83
	FALLACIES	Cognitive	Williams' Gambling Fallacies Scale + GCI	5 min	S, T	test-retest (6 mo) = .67	correlates significantly with university math GPA and CPGI score
	FSIQ		Wechsler Abbreviated Scale of Intelligence (Matrices & Vocabulary subtests)	15 min	S	Subtests: - Split-half reliabilities = 0.81-0.98 - Test-retest = high 0.7 - high 0.8	Correlates significantly with other Wechsler scales ⁶
	INTROVERSION-EXTRAVERSION (warmth, gregariousness, assertiveness, activity, excitement-seeking, positive emotions) NEUROTICISM-EMOTIONAL STABILITY (anxiety, depression, hostility, self-consciousness, impulsivity, vulnerability) OPENNESS-CLOSE-MINDEDNESS (fantasy, aesthetics, feelings, actions, ideas, values)		Lazarus' Ways of Coping ⁷	10 min	S	Cronbach's Alpha = 0.61-0.79 for all scales	Not determined: evidence of construct validity in the fact that results of studies utilizing this instrument are consistent with theoretical predictions ⁸

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ¹	RELIABILITY	VALIDITY
		Temperament/ Personality	NEO-Personality Inventory (Extraversion and Neuroticism) NEO-SSF (Openness, Agreeableness, and Conscientiousness)	25- 30 min	S	Domains: Reliabilities = 0.86-0.95	Strong consensual validity between self, peer and spouse reporting. Scales correlate with analogous scales from other instruments, such as Myers- Briggs, MMPI, etc. ⁹
PSYCHOPATHOLOGY	INTERNALIZING PROBLEMS (Anxiety Disorders; Mood Disorders; Somatoform Disorders; Dissociative Disorders; Eating Disorders) EXTERNALIZING PROBLEMS (Substance Abuse; Antisocial Behaviour; Impulse-Control Problems; ADHD) THOUGHT DISORDERS (Schizophrenia; Dementia; Paranoia)	Cognitive	Conners' ADHD¹⁰	10 min	I	Internal consistency = 0.66-0.90 Test-retest (1 month) = 0.8- 0.95	Effectively discriminates between clinical and control groups. ¹¹
		Externalising Problems and Internalising Problems	Personality Assessment Inventory (PAI)	45 min	S	Scales: -Internal reliability = 0.45- 0.90 -Test-retest (3-4 weeks) = 0.31- 0.92	Concurrent validity with other personality instruments is moderate. ¹²

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ¹	RELIABILITY	VALIDITY
			Composite International Diagnostic Interview Short Form (CIDI-SF): depression; GA; phobia; social phobia; panic; agoraphobia; alcohol dependence; drug dependence	7 min	S, T	-Test-retest (1-6 day) is adequate for research purposes. -Agreement for all diagnoses = 97%	A high degree of diagnostic concordance between CIDI and clinical ICD-10 and DSM-III-R diagnoses. ¹³
			+ questions about tobacco, alcohol & drug frequency from Canadian Community Health Survey	5 min	S, T	NA	NA
STRESSORS		Stressors	Life Events Questionnaire	5 min	S, I	Test-retest (2 weeks) = excellent ¹⁴	
PHYSICAL HEALTH			SF36, or SF8, (physical functioning score; mental component score)	10 min	S, I	Internal consistency and test-retest for all subtests > 0.7	Good convergent validity indicated by high correlation with conceptually related variables, such as utilisation of healthcare services. ¹⁵
			Health Utility Index (HUI) from CCHS		I	NA	NA
			Interviewer Notes on Visible Physical Disabilities	1 min	I	NA	NA

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ¹	RELIABILITY	VALIDITY
FAMILY	History	Family History	Childhood Trauma Questionnaire	5 min	S	Subscales: -Internal consistency = 0.66-0.92 -Test-retest (4 months) = 0.79-0.86	Correlations between therapist ratings and CTQ subscales = 0.42-0.72 ¹⁶
			Follow-up to CIDI questions	? min	I	NA	NA
	GENERAL FUNCTIONING (RELATIONSHIP: cohesion, expressiveness, conflict) (PERSONAL GROWTH: independence, achievement orientation, intellectual orientation, active orientation, moral emphasis) (SYSTEM MAINTENANCE: organization, control)	Family Environment	Family Environment Scale (FES)	15 min	S	Subscales: -Internal consistency = 0.61-0.78 -Test-retest (2 months) = 0.68-0.86	Construct and discriminant validity are good. ¹⁷
	MARITAL FUNCTIONING		Kansas Marital Satisfaction Scale	2 min	S	Internal consistency = 0.93	KMS correlates substantially with other marital satisfaction scales. ¹⁸
SOCIAL		Extra-Familial Environment	Luben Social Network Scale	5 min	S, I	Internal consistency = 0.70	Correlates significantly with selected health measures. ¹⁹
			York Ethnicity Scale or Orthogonal Culture Scale	5 min	S, I	Internal consistencies range from 0.67 to 0.84.	Evidence of both convergent and discriminant validity. ²⁰
			Rohrbaugh Jessor Religiosity Scale	7 min	S, I	Internal consistency = 0.90	Correlates well with self rating. ²¹
			Buckner neighborhood Cohesion Scale	7 min	S, I	Internal consistency = 0.95	Discriminates between theoretically different communities. ²²

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ¹	RELIABILITY	VALIDITY
PREVENTION AND TREATMENT		Prevention and Treatment	Hodgins Prevention item	1 min	S, I	NA	NA
			Christchurch Health and Development Study Item	1 min	S, I	NA	NA
BIOLOGICAL	Executive functioning	Biological Risk	Wisconsin card sorting test	10 min	S	Internal consistency reliabilities = 0.6-0.85	Has been found to be useful for differentiating brain dysfunctions. ²³

ADOLESCENT INSTRUMENTATION (shaded sections are repeated each year, white sections will only be included in the first year, green sections will only be included in following years)

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ²⁴	RELIABILITY	VALIDITY
DEMOGRAPHICS		Demographics	CPGI or GSS + religion + collaterals + postal code + e-mail + SES + family ²⁵	8 min	I, T	NA ²⁶	NA
RETENTION		Retention	+ e-mail +SIN + driver's licence # + name of high school	10 min	I	NA	NA
GAMBLING	EARLY GAMBLING HISTORY	Gambling involvement	CPGI Q1-30	2 min	I, T	CPGI internal consistency reliability = 0.93	CPGI correlation with DSM-IV = 0.83 ²⁷
	MOTIVATION FOR GAMBLING		CPGI	1 min	I, T	CPGI internal consistency reliability = 0.93	CPGI correlation with DSM-IV = 0.83
	PAST YEAR BEHAVIOUR (\$, frequency, time, type, context, big win, big loss, exposure to prevention or treatment; self-report of why their behaviour changed in past year)		CPGI (\$ modified)	20 min	I, T	CPGI internal consistency reliability = 0.93	CPGI correlation with DSM-IV = 0.83
	KNOWLEDGE OF GAMBLING & PROBLEM GAMBLING	Broader Socio-Cultural Factors	Williams' Gambling Knowledge Scale	5 min	I	untested on adults	untested on adults

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ²⁴	RELIABILITY	VALIDITY
	ATTITUDE TOWARD GAMBLING		Gambling Attitudes: Williams scale + AGLC Hardness of Gambling Scale + selected Canada West Foundation questions	5 min	I	Williams scale: test-retest (6 mo) = .70	Williams scale: strongest predictor of current gambling behaviour and 6 mo gambling behaviour among all variables ²⁸
	PROBLEM & PATHOLOGICAL	Gambling Disorders	Fisher DSM-IV-J-MR	5 min	I	Internal consistency = 0.75 ²⁹	Correlates significantly with SOGS-RA ³⁰
	FALLACIES	Cognitive	Williams' Gambling Fallacies Scale + GCI	5 min	I	test-retest (6 mo) = .67	Correlates significantly with university math GPA and CPGI score
	FSIQ		Wechsler Abbreviated Scale of Intelligence (Matrices & Vocabulary subtests)	15 min	S	Subtests: Split-half reliabilities = 0.81-0.98 Test-retest = high 0.7 - high 0.8	Correlates significantly with other Wechsler scales into ³¹
PSYCHOPATHOLOGY	INTERNALIZING PROBLEMS (Anxiety Disorders; Mood Disorders; Somatoform Disorders; Dissociative Disorders; Eating Disorders) EXTERNALIZING PROBLEMS (Substance Abuse; Antisocial Behaviour; Impulse-Control Problems; ADHD) THOUGHT DISORDERS (Schizophrenia; Dementia; Paranoia)	Cognitive	Conners ADHD ³²	5 min	I	Internal consistency = 0.66-0.90 Test-retest (1 month) = 0.8-0.95	Effectively discriminates between clinical and control groups. ³³

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ²⁴	RELIABILITY	VALIDITY
		Temperament/ Personality	Child Behavior Checklist (Parent Form & Youth Self-Report)	15 min	S	Syndrome scores: one-week test-retest> 0.8 internal consistency> 0.8 interparent agreement=0.66	CBC is the gold standard ³⁴
		Externalising Problems	+ questions about tobacco, alcohol & drug frequency from Canadian Community Health Survey	5 min	I	NA	NA
STRESSORS		Stressors	Life Events Questionnaire	5 min	S, I	Test-retest (2 weeks) = excellent ³⁵	
PHYSICAL HEALTH			SF36 or SF10 (physical functioning score; mental component score) ³⁶	15 min	S, I	Test-retest (1-6 day) is adequate for research purposes. Agreement for all diagnoses = 97%	A high degree of diagnostic concordance between CIDI and clinical ICD-10 and DSM-III-R diagnoses. ³⁷
			Health Utility Index (HUI) from CCHS	10 min	I	NA	NA
			Interviewer Notes on Visible Physical Disabilities	1 min		NA	NA

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ²⁴	RELIABILITY	VALIDITY
FAMILY	History	Family History	Childhood Trauma Questionnaire	5 min	S	Subscales: Internal consistency = 0.66-0.92 Test-retest (4 months) = 0.79-0.86	Correlations between therapist ratings and CTQ subscales = 0.42-0.72 ³⁸
			Follow-up to health questions	? min	I	NA	NA
	GENERAL FUNCTIONING (RELATIONSHIP: cohesion, expressiveness, conflict) (PERSONAL GROWTH: independence, achievement orientation, intellectual orientation, active orientation, moral emphasis) (SYSTEM MAINTENANCE: organization, control)	Family Environment	Family Environment Scale (FES)	15 min	S	Subscales: Internal consistency = 0.61-0.78 Test-retest (2 months) = 0.68-0.86	Construct and discriminant validity are good. ³⁹
SOCIAL		Extra-Familial Environment	Luben Social Network Scale	5 min	S, I	Internal consistency = 0.70	Correlates significantly with selected health measures. ⁴⁰
			York Ethnicity Scale or Orthogonal Culture Scale	5 min	S, I	Internal consistencies range from 0.67 to 0.84.	Evidence of both convergent and discriminant validity. ⁴¹
			Rohrbaugh Jessor Religiosity Scale	7 min	S, I	Internal consistency = 0.90	Correlates well with self rating. ⁴²
			Buckner neighborhood Cohesion Scale	7 min	S, I	Internal consistency = 0.95	Discriminates between theoretically different communities. ⁴³
AN		Prevention and Treatment	Hodgins Prevention item	1 min	I	NA	NA

AREA	SUB AREA	DOMAIN FROM CONCEPT FRAME	TEST	TIME	ADMIN ²⁴	RELIABILITY	VALIDITY
			Christchurch Health and Development Study Item	1 min	I	NA	NA
BIOLOGICAL	Executive functioning	Biological Risk	Wisconsin card sorting test	10 min	S	Internal consistency reliabilities = 0.6-0.85	Has been found to be useful for differentiating brain dysfunctions. ⁴⁴

REFERENCES (APPENDIX 3)

¹ I = interview, S = self-administered, T = telephone

² GSS = General Social Survey

³ # biological siblings; # stepsiblings; whether raised by biological parents or stepparents; whether adopted.

⁴ Ferris, J., & Wynne, H. (2001). *The Canadian Problem Gambling Index: User Manual*. Ottawa: Canadian Centre on Substance Abuse.

⁵ get reference

⁶ Mental Measurements Yearbook, 14.

⁷ next year

⁸ MMY, 6.

⁹ MMY, 12.

¹⁰ next year

¹¹ MMY, 15.

¹² MMY, 12.

¹³ MMY, 13.

¹⁴ Vuchinich, R.E., Tucker, J.A. and Harllee, L.M. (1986) *Individual Differences in the Reliability of Alcoholics' Report of Drinking*. American Psychological Association.

¹⁵ MMY, 14.

¹⁶ Scher, Christine D., Murray B. Stein, Gordon J.G. Asmundson, Donald R. McCreary and David R. Forde. (2001) "The Childhood Trauma Questionnaire in a Community Sample: Psychometric Properties and Normative Data." *Journal of the Traumatic Stress* 14, 4 843-857.

¹⁷ MMY, 14.

¹⁸ Schumm, Walter R., Lois A. Paffe-Bergen, Ruth C. Hatch, Felix C. Obiorah, Jennette M. Copeland, Lori D. Meens, and Margaret A. Bugaighis. (1986) "Concurrent and Discriminative Validity of the Kansas Marital Satisfaction Scale

¹⁹ Lubben, James E. (1988) Assessing Social Networks among Elderly Populations. *Family Community Health* 11(3): 42-52.

²⁰ Cameron, J.E. (2004). A three-factor model of social identity. *Self and Identity*, 3, 239-262.

²¹ Boivin, Michael. (1999) "Religiosity Measure." In *Measures of Religiosity*. Ed. Peter C. Hill and Ralph W. Hood Jr. Birmingham, Alabama: Religious Education Press.

²² Buckner, John. (1988) "The Development of an Instrument to Measure Neighborhood Cohesion." *American Journal of Community Psychology*. 16(6): 771-791.

²³ MMY, 15.

²⁴ I = interview, S = self-administered, T = telephone

²⁵ # biological siblings; # stepsiblings; whether raised by biological parents or stepparents; whether adopted.

²⁶ NA = not applicable

²⁷ Ferris, J., & Wynne, H. (2001). *The Canadian Problem Gambling Index: User Manual*. Ottawa: Canadian Centre on Substance Abuse.

²⁸ *get reference

²⁹ Fisher, S.E. (2000) Developing the DSM-IV Criteria to Identify Adolescent Problem Gambling in Non-Clinical Populations. *Journal of Gambling Studies* 16(2/3): 253-273.

³⁰ Derevensky J.L. and R. Gupta (2000) Prevalent Estimates of Adolescent Gambling: A Comparison of the SOGS-RA, DSM-IV-J, and the GA 20 Questions.

Journal of Gambling Studies 16(2/3): 227-251.

³¹ Mental Measurements Yearbook, 14.

³² next year

³³ MMY, 15.

³⁴ MMY, 13.

³⁵ Vuchinich, R.E., Tucker, J.A. and Harllee, L.M. (1986) *Individual Differences in the Reliability of Alcoholics' Report of Drinking*. American Psychological Association.

³⁶ Possibly use short form SF8

³⁷ MMY, 13.

³⁸ Scher, Christine D., Murray B. Stein, Gordon J.G. Asmundson, Donald R. McCreary and David R. Forde. (2001) "The Childhood Trauma Questionnaire in a Community Sample: Psychometric Properties and Normative Data." *Journal of the Traumatic Stress* 14, 4 843-857.

³⁹ MMY, 14.

⁴⁰ Lubben, James E. (1988) Assessing Social Networks among Elderly Populations. *Family Community Health* 11(3): 42-52.

⁴¹ Cameron, J.E. (2004). A three-factor model of social identity. *Self and Identity*, 3, 239-262.

⁴² Boivin, Michael. (1999) "Religiosity Measure." In *Measures of Religiosity*. Ed. Peter C. Hill and Ralph W. Hood Jr. Birmingham, Alabama: Religious Education Press.

⁴³ Buckner, John. (1988) "The Development of an Instrument to Measure Neighborhood Cohesion." *American Journal of Community Psychology*. 16(6): 771-791.

⁴⁴ MMY, 15.

APPENDIX 4:

THE SEARCH FOR GENETIC POLYMORPHISM - BLOOD SAMPLE: 10 ml

DOPAMINE REWARD

- Dopaminergic neurotransmission may be involved in learning, reinforcement of behavior, attention, and sensorimotor integration. Binding of the radioligand C-labelled raclopride to dopamine D2 receptors is sensitive to levels of endogenous dopamine, which can be released by pharmacological challenge. Here we use C-labelled raclopride and positron emission tomography scans to provide evidence that endogenous dopamine is released in the human striatum during a goal-directed motor task, namely a video game. Binding of raclopride to dopamine receptors in the striatum was significantly reduced during the video game compared with baseline levels of binding, consistent with increased release and binding of dopamine to its receptors. The reduction in binding of raclopride in the striatum positively correlated with the performance level during the task and was greatest in the ventral striatum. These results show, to our knowledge for the first time, behavioral conditions under which dopamine is released in humans, and illustrate the ability of positron emission tomography to detect neurotransmitter fluxes *in vivo* during manipulations of behavior (Koepp et al, 1998).
- To test the hypothesis that the DRD1 gene might play a role in addictive behaviors we examined the alleles of the Dde I polymorphism in three independent groups of subjects with varying types of compulsive, addictive behaviors – Tourette syndrome probands, smokers and pathological gamblers. In all three groups there was a significant increase in the frequency of homozygosity for the DRD1 Dde I 1 or 2 alleles in subjects with addictive behaviors. (Comings et al., 1997)

MAO/SEROTONIN/IMPULSIVITY

- There was a significant association between allele distribution and the subgroup of severe male gamblers (n = 31) compared to the males in the group of healthy volunteers ($\chi^2 = 5246$; df = 1; p < 0.05 [Bonferroni corrected]). No association was found between the MAOB polymorphic marker and PG. Allele variants at the MAOA, but not the MAOB gene may be genetic liability factor in PG, at least in severe male gamblers.
- DNA amplification and genotyping: All patients and comparison subjects were screened by molecular analysis of specific DNA polymorphisms at the MAOA and MAOB genes. DNA was isolated from 10 ml of peripheral blood samples according to standard methods. DNA was amplified using polymerase chain reaction (PCR). For the MAOA gene we studied a VNTR marker that was located in the first intron of the gene; PCR amplification was made using the primers and conditions described by Hinds et al. For the MAOB gene we analyzed a dinucleotide sequence (GT)_n in the second intron of the gene. Amplified products obtained by PCR were resolved by electrophoresis in denaturing polyacrylamide gels and detected by silver staining (Ibanez et al, 2000).

POLYMORPHISM

- Pathological gambling is an impulsive disorder. The serotonin transporter gene (5-HTT) may be a good candidate gene to confer susceptibility to pathological gambling, since neurotransmission

mediated by serotonin (5-HT) has been implicated in anxiety (Westenberg et al., 1996) and pathological gambling (Moreno et al., 1991). On the other hand, 5-HTT is very important in the mechanism of action of the selective serotonin reuptake inhibitors (SSRIs), which are useful in treating depression, obsessive-compulsive disorders and eating disorders. Recently, a functional polymorphism (5'-HTTLPR) has been reported in the promoter region of this gene (Heils et al., 1996) where there are two allelic forms that show different promoter activity in lymphoblasts and JAR cells (Collier et al., 1996; Heils et al., 1996). This singular polymorphism has been associated with susceptibility to anxiety-related traits and affective disorders (Collier et al., 1996; Lesch et al., 1996).

- To date, little is known about the genetic basis of pathological gambling. Two recent studies reported a genetic association analysis between polymorphisms in either D2 or D4 dopamine receptor genes and pathological gambling, which suggested the involvement of the dopaminergic system in the aetiology of this impulsive disorder. Our findings are in agreement with previous analyses that showed a dysfunction of the serotonergic system in pathological gambling, the existence of positive associations between the short variant of this functional polymorphism with either anxiety-related traits, severe alcohol dependence and affective disorders. However, these findings have not been reproduced in other studies. These contradictory results could be explained by assuming the existence of genetic heterogeneity or by the possibility that pathological gambling is inherited multifactorially with a variable relevance for this gene in different populations. In fact, the relative risk value obtained for the short variant in the male gamblers suggests that the 5-HTT polymorphism contributes a modest but reliable percentage of the genetic susceptibility to pathological gambling. Hence, 5-HTT could be considered as a minor gene involved in the aetiology of this illness.

In summary, we showed that pathological gambling may be influenced by sex-related factors, at least in the Spanish population, since the short variant of the 5-HTT polymorphism was significantly associated only with male gamblers (Perez de Castro, et al., 1999).

APPENDIX 5
PEDIATRIC CONSENT FORM
ON LETTERHEAD

TITLE:

FACTORS INFLUENCING THE DEVELOPMENT OF RESPONSIBLE GAMBLING: A PROSPECTIVE STUDY

SPONSOR:

Alberta Gaming Research Institute

INVESTIGATORS:

N. el-Guebaly, D. Hodgins, G. Smith, R. Williams, V. Williams,
D. Schopflocher, R. Wood

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your child's participation will involve. If you would like more detail about something mentioned here, or information not included here, please ask. Take the time to read this carefully and to understand any accompanying information. You will receive a copy of this form.

BACKGROUND

Gambling is a normative activity in the Alberta population, with 82% of the adult population having gambled in the past year. Although the large majority of Albertans gamble responsibly, there is a small percentage that experience significant problems. The design of effective educational and legislative strategies to minimize the harm caused by gambling hinges on understanding the factors that promote responsible gambling and/or make people susceptible to problem gambling.

Studies conducted over many years are the optimal approach for investigating such questions. This approach has been used extensively and successfully in the fields of health, mental health, sociology and addiction. Unfortunately, there exist virtually no such studies of gambling. It is this important gap in the research literature that provided the impetus to carry out the present study.

The present project will study 2000 Albertans over a 5-year period from 2004 to 2009. The entire sample has been selected by means of random digit dialing stratified by region (Edmonton, Calgary, rural Alberta).

WHAT IS THE PURPOSE OF THE STUDY?

The development of a comprehensive model of gambling behavior will elucidate several questions: What are the normal patterns of starting and stopping gambling? What factors and behavior patterns are most predictive of current and future responsible gambling and problem gambling? What is the impact of gambling availability, legislative initiatives, and prevention programs on the development of problem and responsible gambling?

And, how do all of these things vary as a function of age and gender? These are all questions whose answers will inform effective educational and legislative initiatives to maximize the benefits of gambling and minimize the harm. Finally, it is anticipated that the richness of the resulting database will also serve as a valuable resource for many other non-gambling investigations by other research groups.

WHAT WOULD MY CHILD HAVE TO DO?

This initial interview will be conducted face-to-face and will comprehensively assess all individual and societal variables potentially relevant to gambling behavior. This will include psychological testing, such as an IQ test. This interview can be expected to take up to four hours. Your child will subsequently be contacted by telephone a minimum of four more times, on an annual basis. These telephone interviews will take no longer than one to two hours. In total, the study covers a five-year period.

WHAT ARE THE RISKS?

There are no clear risks to your child. The interview will cover personal information that may be upsetting to some individuals. You will be provided with information about available support services (e.g., crisis lines).

ARE THERE ANY BENEFITS FOR MY CHILD?

If you agree for your child to participate in this study, there will not be a direct benefit to them. The information we get from this study may help us to provide better treatments in the future for patients with gambling addictions and to inform effective educational and legislative initiatives.

DOES MY CHILD HAVE TO PARTICIPATE?

Participation in this study is voluntary. Your child may refuse to answer questions at any time during the study and can withdraw from the study at any time for any reason. The principle researchers may also withdraw your child from the study if they choose to.

WHAT ELSE DOES MY CHILD'S PARTICIPATION INVOLVE?

You will be asked to provide the names of up to three people who are likely to know where you are if we are unable to contact you, as well as other useful information (e.g., SIN, email addresses, etc.). This information will only be used for the purpose of keeping in touch with you over the next five years. These contacts will be informed that your child has volunteered for a study with the University of _____ and that we wish to locate them. No other information will be provided to protect privacy. You will also be asked to provide the names of family members or friends to act as corroborators of your child's reports of gambling involvement.

You will also be asked to provide your child's Alberta Health Care number and your permission to access their health records in order to track their use of health resources.

Portions of the interview may be audio-recorded for review by other personnel to ensure accuracy on the part of the interviewers. Audio tapes will be erased after the accuracy check is complete.

WILL WE BE PAID FOR PARTICIPATING, OR DO WE HAVE TO PAY FOR ANYTHING?

Your child will be paid \$75 for the initial interview, \$30 for year 2, 3 & 4 and \$75 for the final interview. Larger payments are intended to cover the costs of travelling to the interview location.

WILL MY CHILD'S RECORDS BE KEPT PRIVATE?

The interview results will be confidential and will not be made public in any form in which your child could be personally identified as a participant. Only the principal investigators, the University of Calgary Conjoint Health Research Ethics Board and the research coordinator will have access to your child's personal information.

All information that could be used to identify your child will be eliminated from the data collected and replaced with an untraceable identifier. Data transfer between universities will be done in a secure manner, without identifying information. The information will be kept at all times in a secure place to which only the researchers have access. The dataset stripped of identifying information may be made accessible to other researchers after the completion of this project.

Confidentiality will be maintained at all times unless your child reveals that he or she is an immediate danger to him or herself. In such cases, protection will be provided which may require not maintaining confidentiality.

SIGNATURES

Your signature on this form indicates that you have understood to your satisfaction the information regarding your child's participation in the research project and agree to their participation as a subject. In no way does this waive your legal rights nor release the investigators, or involved institutions from their legal and professional responsibilities. You are free to withdraw your child from the study at any time without jeopardizing their health care. If you have further questions concerning matters related to this research, please contact:

Dr. _____ (403) ____-____

or

Dr. _____ (403) ____ - ____

If you have any questions concerning your child's rights as a possible participant in this research, please contact Pat Evans, Associate Director, Internal Awards, Research Services, University of Calgary, at 220-3782.

_____ Parent/Guardian's Name	_____ Signature and Date
_____ Child's Name	_____ Signature and Date
_____ Investigator/Delegate's Name	_____ Signature and Date
_____ Witness' Name	_____ Signature and Date

The investigator or a member of the research team will, as appropriate, explain to your child the research and his or her involvement. They will seek your child's ongoing cooperation throughout the study.

The University of Calgary Conjoint Health Research Ethics Board has approved this research study.

A signed copy of this consent form has been given to you to keep for your records and reference.

INFORMATION SHEET

This is a study on people's gambling behaviours. If you choose to participate, you will be asked a number of questions about how you feel, activities you participate in, your family and friends, your health and your beliefs. Psychological testing will be done, such as an IQ test. Some of the answers you will be asked to write down and some you may be asked to answer on a computer. In total, this will take approximately four hours. In approximately a year, you will be contacted by telephone and asked to answer a number of similar questions. This will be repeated every year for the three years after that.

For your participation, you will be paid \$50 for the initial interview, \$30 for year 2, 3 & 4 and \$75 for the final interview.

Your participation is completely voluntarily. If there is a question that you do not wish to answer, you do not have to do so. If at any time, for any reason, you wish to stop, you may do so.

CONSENT FORM (Adult)

ON LETTERHEAD

TITLE:

FACTORS INFLUENCING THE DEVELOPMENT OF RESPONSIBLE GAMBLING: A PROSPECTIVE STUDY

SPONSOR:

Alberta Gaming Research Institute

INVESTIGATORS:

N. el-Guebaly, D. Hodgins, G. Smith, R. Williams, V. Williams,
D. Schopflocher, R. Wood

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, please ask. Take the time to read this carefully and to understand any accompanying information. You will receive a copy of this form.

BACKGROUND

Most people gamble in some type of game or raffle in a given year but only a small number gamble excessively. Studies conducted over many years are the best way to understand gambling and problem gambling. The present project will study 2000 Albertans over a 5-year period from 2004 to 2009. The entire sample has been selected by random telephone dialing in three regions (Edmonton, Calgary, and rural Alberta).

WHAT IS THE PURPOSE OF THE STUDY?

A clear understanding of gambling behavior and how it related to other lifestyle issues will inform effective educational and legislative initiatives to maximize the benefits of gambling and minimize the harm.

WHAT WOULD I HAVE TO DO?

This initial interview will be conducted face-to-face and will comprehensively assess all individual and societal variables potentially relevant to gambling behavior. This will include psychological testing, such as an IQ test. This interview can be expected to take up to four hours. You will subsequently be contacted by telephone a minimum of four more times, on an annual basis. These telephone interviews will take no longer than one to two hours. In total, the study covers a five-year period.

WHAT ARE THE RISKS?

There are no clear risks to you. Because the interview will cover personal information, some questions may be upsetting to some individuals. If required you would be provided with information about available support services (e.g., crisis lines, local therapy services).

ARE THERE ANY REPRODUCTIVE RISKS?

No

WILL I BENEFIT IF I TAKE PART?

If you agree to participate in this study, there will not be a direct benefit to yourself. The information we get from this study may help us to provide better treatments in the future for people with gambling addictions and to inform effective educational and legislative initiatives.

DO I HAVE TO PARTICIPATE?

Participation in this study is voluntary. You may refuse to answer questions at any time during the study and can withdraw from the study at any time for any reason. The principle researchers may also withdraw you from the study if they choose to. Our hope is that all participants will complete all of the five interviews.

WHAT ELSE DOES MY PARTICIPATION INVOLVE?

You will be asked to provide the names of up to three people who are likely to know where you are if we are unable to contact you, as well as other useful information (e.g., SIN, email addresses, etc.). This will include psychological testing, such as an IQ test. These contacts will be informed that you have volunteered for a study with the University of _____ and that we wish to locate you. No other information will be provided to protect privacy. You will also be asked to provide the names of family members or friends to act as corroborators of your description of your behaviours.

You will also be asked to provide your Alberta Health Care number and your permission to access your health records in order to track your use of health resources.

Portions of the interview may be audio-recorded for review by other personnel to ensure accuracy on the part of the interviewers. Audio tapes will be erased after the accuracy check is complete.

WILL I BE PAID FOR PARTICIPATING, OR DO I HAVE TO PAY FOR ANYTHING?

Your child will be paid \$75 for the initial interview, \$30 for year 2, 3 & 4 and \$75 for the final interview. Larger payments are intended to cover the costs of travelling to the interview location.

WILL MY RECORDS BE KEPT PRIVATE?

The interview results will be confidential and will not be made public in any form in which you could be personally identified as a participant. Only the principal investigators, the University of Calgary Conjoint Health Research Ethics Board and the research coordinator will have access to your personal information.

All information that could be used to identify you will be eliminated from the data collected and replaced with an untraceable identifier. Data transfer between universities will be done in a secure manner, without identifying information. The information will be kept at all times in a secure place to which only the researchers

have access. The dataset stripped of identifying information may be made accessible to other researchers after the completion of this project.

Confidentiality will be maintained at all times unless you reveal that you are an immediate danger to yourself. In such cases, protection will be provided which may require not maintaining confidentiality.

SIGNATURES

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. If you have further questions concerning matters related to this research, please contact:

Dr. _____ (403) ____ - ____

Or

Dr. _____ (403) ____ - ____

If you have any questions concerning your rights as a possible participant in this research, please contact Pat Evans, Associate Director, Internal Awards, Research Services, University of Calgary, at 220-3782.

_____ Participant's Name	_____ Signature and Date
_____ Investigator/Delegate's Name	_____ Signature and Date
_____ Witness' Name	_____ Signature and Date

The University of Calgary Conjoint Health Research Ethics Board has approved this research study.
A signed copy of this consent form has been given to you to keep for your records and reference.

APPENDIX 6

ESTIMATED BUDGET - COST/YEAR BREAKDOWN

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Pilot - recruitment	\$8,610	-	-	-	-	\$8,610
Pilot - AGRI	<u>\$16,675</u>	-	-	-	-	<u>\$16,675</u>
<i>Total (pilot)</i>	<u>\$25,285</u>					<u>\$25,285</u>
Cohort - recruitment	\$139,597	-	-	-	-	\$139,597
Cohort - AGRI						
Project coordinator	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$350,000
Secretarial assistance	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$75,000
Research assistance *	\$140,000	\$87,750	\$82,460	\$91,060	\$102,410	\$503,680
Research analyst	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$60,000
Project coordinator travel	\$2,000	\$1,000	\$1,000	\$1,000	\$2,000	\$7,000
Research assistance travel	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$40,000
Financial administrator	\$22,500	\$22,500	\$22,500	\$22,500	\$22,500	\$112,500
Equipment	\$17,500	-	-	-	-	\$17,500
Printing	\$5,000	\$2,000	\$2,000	\$2,000	\$2,000	\$13,000
Rental of community halls (5)	\$31,500	-	-	-	-	\$31,500
Catering for baseline (5)	\$21,000	-	-	-	-	\$21,000
Participation fees**	\$150,000	\$56,400	\$53,010	\$48,780	\$109,725	\$417,915
Production of calendar	-	\$20,000	-	-	-	\$20,000
Telecommunications costs	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$15,000
Office supplies/copying	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$10,000
	<u>\$449,500</u>	<u>\$299,650</u>	<u>\$270,970</u>	<u>\$275,340</u>	<u>\$348,635</u>	<u>\$1,644,095</u>
Cohort - recruitment	\$139,597	-	-	-	-	\$139,597
Cohort - AGRI	\$449,500	\$299,650	\$270,970	\$260,160	\$314,545	\$1,644,095
Pilot	<u>\$25,285</u>		-	-	-	<u>\$25,285</u>
Grand total by year	\$664,382	\$299,650	\$270,970	\$260,160	\$314,545	\$1,858,977

**Research assistant cost calculation:*

Based on rate of 2 interviews/day in Year 1 @ \$20/hr and 7 hr/day - 1000 days @ \$140/day;
 40 participants potentially carried forward from pilot study (may reduce costs); 3
 interviews/day in Years 2 and 3; 2.5 interviews/day in Year 4 and 2 in Year 5 at same rate;
 presumes space provided by universities for research assistants and conducting interviews
 in Edmonton and Calgary

***Participation fees:*

Attrition	# of participants	2,000	1,880	1,767	1,626	1,463
	Rate	-	6%	6%	8%	10%
Participation fees/subject		\$75	\$30	\$30	\$30	\$75
<i>Total fees</i>		\$150,000	\$56,400	\$53,010	\$48,780	\$109,725
						\$417,915

Participant travel -not included; assumed to be minimal

Peer review stipends - from previously approved funds

Notes to Cost Estimate for Alberta Gaming Research Institute Component

Description	Total
Project Co-ordinator (academic), 2004-2009: Recruitment, training and supervision of research support staff; planning activities; liaison with recruitment organisation and AGRI project teams; data analysis in consultation with principal researchers) 1 FTE @ \$70,000/yr for 5 yrs	\$350,000
Secretarial support, 2004-2009: Project support, communication activities, document production support .5 FTE @ \$15,000/yr for 5 yrs	\$75,000
Research Assistants, 2004-2009: Administration of follow-up mail and/or telephone interviews; coding and data entry of questionnaires; data cleaning; assist with data analysis (initially est. 9 RA's reduced, due to subject attrition and interview type, to 6) (see * on budget page for calculation)	\$503,680
Research Analyst (Contractor), 2004-2007: Data construction and manipulation, data merging and technical consultation (eg. SPSS/other expertise) \$12,000/yr for 4 yrs	\$60,000
Project Coordinator travel, 2003-2007: Airfare, car rental, accommodations and meal allowances (training days, meetings)	\$7,000
Research Assistant meeting and presentation travel, 2003-2007 \$8,000/yr for 5 yrs	\$40,000
Financial administrator .5 FTE @ \$22,500/yr for 5 yrs	\$112,500
Equipment 7 computer/printers @ \$2,500/unit	\$17,500
Printing: Questionnaires, consent forms, information sheets, training manuals and administrative documents	\$13,000
Rental of community halls: Sites for intake interviews <i>Rates vary from \$150-\$400 (depending on time of day and length of booking)</i> 21 days * 5 sites @ \$300 per day	\$31,500
Catering: Beverages and snacks for baseline study 21 days * 5 sites @ \$200 per day	\$21,000
Participation Fees (see ** on budget page for calculation)	\$367,915
Participant travel (dependent on subject recruitment - assumed to be minimal)	To be calculated
Production of Calendar (for distribution to research participants 4 issues at 20,000/issue; 1 st issue (2004) costed, subsequent issues possible external/other support)	\$20,000
Long distance charges: Communications with Project Co-ordinator and AGRI Research Team) \$5,000/university	\$15,000
Office supplies, postage and photocopying	\$10,000
Proposal peer reviews (\$3000 American) - from previous Board approved funds	N/A

Note: The total cost estimate excludes AGRI overhead, project planning, and assumes that office space for the proposed project will be provided by each of the three participating universities.

Notes to Cost Estimate for Recruitment – Pilot

Item	Total Cost
Supervised interviewing and long-distance charges	\$2,782-\$4,498
CATI programming	\$200
Data cleaning and production of deliverables	\$400
Programming of RDD sampling frame	\$254
Total	\$3,636-\$5,352

Notes to Cost Estimate for Recruitment – Cohort

Item	Total Cost
Supervised interviewing and long-distance charges	\$90,133 – \$146,466
CATI programming	NA
Data cleaning and production of deliverables	\$400
Programming of RDD sampling frame	\$5,600-\$9,200
Total	\$95,733-\$155,666

*Quote based on a cost of \$26 per interviewer hour

*Estimate of project cost will be more precise once the pilot is completed

Factors Influencing the Development of Responsible Gambling - A Prospective Study

Recruitment of 2000 Subjects

10-Apr-03

August 26, 2003:

Modified by V. Williams (names of specific locations deleted)

Age Group	Total Per Age Group		Sample Across Four Sampling Areas in Alberta
13-15 Normal	200	400	City of Edmonton, City of Calgary, High Risk Gambling Area and Low Risk Gambling Area
13-15 High Risk	200		
18-20 Normal	200	400	Sample across four sampling areas: City of Edmonton, City of Calgary, High Risk Gambling Area and Low Risk Gambling
18-20 High Risk	200		
23-25 Normal	200	400	Sample across four sampling areas: City of Edmonton, City of Calgary, High Risk Gambling and Low Risk Gambling Area
23-25 High Risk	200		
43-45 Normal	200	400	Sample across four sampling areas: City of Edmonton, City of Calgary, High Risk Gambling Area and Low Risk Gambling Area
43-45 High Risk	200		
63-65 Normal	200	400	Sample across four sampling areas: City of Edmonton, City of Calgary, High Risk Gambling Area and Low Risk Gambling Area
63-65 High Risk	200		
	2000		

	Subjects	Drop-outs	Attrition Rate
Year 1	2000		
Year 2	1880	120	6%
Year 3	1767	113	6%
Year 4	1626	141	8%
Year 5	1463	163	10%

During Year 1, up to 600 subjects will be recruited to replace those who do not complete the intake interview.

Cost Estimate for Alberta Gaming Research Institute Cohort Pilot

Description	Total
Research Assistant, 3 months: Administration of follow-up mail and/or telephone interviews; coding and data entry of questionnaires; data cleaning; assist with data analysis .25 FTE @ \$35,000/yr	\$8,750
Research Assistant meeting and presentation travel	\$2,000
Printing: Questionnaires, consent forms, information sheets, training manuals and administrative documents	\$1,000
Catering: Beverages and snacks for baseline study	\$250
Participation Fees at Baseline Study 40 @ \$75.00	\$3,000
Office supplies, postage and photocopying	\$250
Contingency (10%)	1425

Note: The total cost estimate excludes AGRI overhead, pilot project supervision and oversight, and assumes that office space and equipment for the proposed project will be provided by each of the three participating universities.

<i>Factors Influencing the Development of Responsible Gambling - Prospective Study</i>		
Pilot Recruitment of 40 Subjects		
Age Group	Lethbridge Area	City of Calgary
13-15 Normal	2	2
13-15 High Risk	2	2
18-20 Normal	2	2
18-20 High Risk	2	2
23-25 Normal	2	2
23-25 High Risk	2	2
43-45 Normal	2	2
43-45 High Risk	2	2
63-65 Normal	2	2
63-65 High Risk	2	2
TOTAL	20	20

APPENDIX 7

COHORT SCREENER (normal sample)

Hello, I'm conducting a short 5-minute leisure survey for the _____. Do you have a couple minutes?

I first need to determine your eligibility.

1. Could you tell me in what year were you born? (continue if the person is in an unfilled cell; otherwise):

→ Can you tell me the ages of the other people in your household

→ Could I please speak with the person who is xx years old OR Thank you very much for your time.

	13-15	18-20	23-25	43-45	63-65
male	100	100	100	100	100
female	100	100	100	100	100

2. Could you tell me how long you have lived in Alberta (continue if 3 months or longer)
3. Could you tell me which community you live in? (continue if person in one of the designated areas).
4. Roughly how much money do you spend on restaurant meals in a typical month? (do not record)
5. Roughly how often do you eat out at restaurants in a typical month? Would you say: daily, almost every day, several times a week, a few times a week, once a week, a couple times a month, once a month, or less than once a month? (do not record)
6. Roughly how much money do you spend on gambling in a typical month? This would include things such as lottery, raffle and instant win tickets; Sports Select; slot machines; VLTs; casino table games; horse race betting; bingo; betting on sports with a bookie; internet gambling; or betting against other people on games such as pool, darts, video games, board games, cards, etc. (Note: if asked, 'spend' means how much R is ahead or behind, or their net win or loss).
7. Roughly how often do you do one or more of these things in a typical month? Would you say: daily, almost every day, several times a week, a few times a week, once a week, a couple times a month, once a month, or less than once a month?
8. Roughly how much money do you spend on movies and video rentals in a typical month? (do not record)
9. Roughly how often to you go to the movies or rent videos in a typical month? Would you say: daily, almost every day, several times a week, a few times a week, once a week, a couple times a month, once a month, or less than once a month? (do not record)
10. How would you currently rate your physical health: excellent, good, fair or poor? (do not record)
11. How would you currently rate your mental health: excellent, good, fair or poor? (do not record)
12. Do you smoke? (do not record)
13. Do you drink? (do not record)
14. Thank you. Would you be interested in earning a couple hundred dollars to participate in a more in depth interview? This is a joint project of the University of Lethbridge, University of Calgary, and University of Alberta. We are following people for 5 years to see what changes occur in certain leisure behaviours as a function of mental health, physical health, substance use, etc. We would pay \$215 for 5 interviews, with 1 interview each year. The first interview would be about 4 hours long and have to be done in person. The interviews in years 2, 3, 4, and 5 would be about half that time and could potentially be done over the phone, by mail, or via the internet. All information collected would be strictly confidential and individual records would be destroyed once the data has been combined to provide the overall results. Are you interested?

K. REFERENCES (Sections A-J)

1. Abbott, M.W., Williams, M. & Volberg, R.A. (1999). *Seven-years on: A follow-up study of frequent and problem gamblers living in the community*. Wellington: Department of International Affairs.
2. Achenbach, T. M., Howell, C. T., McConaughy, S. H., & Stanger, C. (1995). Six-year predictors of problems in a national sample of children and youth: I. Cross-informant syndromes. *Journal of the American Academy of Child & Adolescent Psychiatry*, 34, 336-347.
3. Akers, R. L. & Lee, G. (1996). A longitudinal test of social learning theory: Adolescent smoking. *Journal of Drug Issues*, 26, 317-343.
4. Aldwin, C. M., Spiro, A., Levenson, M. R., & Cupertino, A. P. (2001). Longitudinal findings from the normative aging study: III. Personality, individual health trajectories, and mortality. *Psychology & Aging*, 16, 450-465.
5. Alexander, K. L., Entwisle, D. R., & Dauber, S. L. (1996). Children in motion: School transfers and elementary school performance. *Journal of Educational Research*, 90, 3-12.
6. Almqvist, F. (1986). Sex differences in adolescent psychopathology. *Acta Psychiatrica Scandinavica*, 73, 295-306.
7. Almqvist, F. (1988). Mental health in young people in relation to child welfare and institutional care in childhood. *Acta Psychiatrica Scandinavica*, 78, 41-48.
8. American Psychiatric Association. 1994. *Diagnostic and Statistical Manual of Mental Disorders – 4th edition (DSM-IV)*. Washington, D.C.: APA.
9. Andersson, T. & Magnusson, D. (1987). Drinking habits and alcohol abuse among young men: A prospective longitudinal study. *Journal of Studies on Alcohol*, 49, 245-252.
10. Aneshensel, C.S. (2002). *Theory-based data analysis for the social sciences*. Thousand Oaks, CA: Pine Forge Press
11. Aquilino, W.S. (1994). Interview mode effects in surveys of drug and alcohol use. A field experiment. *Public Opinion Quarterly*, 58:210-240.
12. Aquilino, W.S. (1997). Privacy effects on self-reported drug use: Interactions with survey mode and respondent characteristics. In L. Harrison & A. Hughes (Eds), *The Validity of Self-Reported Drug Use: Improving the Accuracy of Survey Estimates (NIDA Research Monograph 167)*. Rockville, MD: U.S. Department of Health and Human Services.
13. Argue, A., Johnson, D. R., & White, L. K. (1999). Age and religiosity: Evidence from a three-wave panel analysis. *Journal for the Scientific Study of Religion*, 38, 423-435.
14. Asikainen, I., Kaste, M., & Sarna, S. (1998). Predicting late outcome for patients with traumatic brain injury referred to a rehabilitation programme: A study of 508 Finnish patients 5 years or more after injury. *Brain Injury*, 12, 95-107.

15. Asved, M. (2002). The psychodynamics and psychology of gambling: The gambler's mind. In *The Gambling Theory and Research Series* 255pp. Charles C. Thomas, Springfield, IL.
16. Baier, Colin J. and Bradley R.E. Wright. (2001). "If You Love Me, Keep My Commandments": A Meta-Analysis of the Effect of Religion on Crime. *Journal of Research in Crime and Delinquency*, 38(1): 3-21.
17. Bailey, R. C., Hser, Y., Hsieh, S., & Anglin, M. D. (1994). Influences affecting maintenance and cessation of narcotics addiction. *Journal of Drug Issues*, 24, 249-272.
18. Banks, M. H. (1988). Employment and training orientations: The ESRC 16-29 Initiative. *Cambridge Journal of Education*, 18, 365-375.
19. Bargagli, A. M., Sperati, A., Davoli, M., Forastiere, F., & Perucci, C. A. (2001). Mortality among problem drug users in Rome: An 18-year follow-up study, 1980-97. *Addiction*, 96, 1455-1463.
20. Barnes, G. M., Reifman, A. S., Farrell, M. P., & Dintcheff, B. A. (1994). The effects of parenting on the development of alcohol misuse: A six-wave latent growth model. *Journal of Marriage and the Family*, 62, 175-186.
21. Barnes, G. M., Welte, J. W., Hoffman, J. H., & Dintcheff, B. A. (1999). Gambling and alcohol use among youth: Influences of demographic, socialization, and individual factors. *Addictive Behaviors*, 24, 749-767.
22. Beardslee, W. R., Son, L., & Vaillant, G. E. (1986). Exposure to parental alcoholism during childhood and outcome in adulthood: A prospective longitudinal study. *British Journal of Psychiatry*, 149, 584-591.
23. Bechara, A., Damasio, H., Damasio, A., & Lee, G. (1999). Afferent contributions of the human amygdala and ventromedial prefrontal cortex to decision-making. *The Journal of Neuroscience*, 13, 5473-5481.
24. Beitchman, J. H., Brownlie, E. B., Inglis, A., & Wild, J. (1996). Seven-year follow-up of speech/language impaired and control children: Psychiatric outcome. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 37, 961-970.
25. Bell, R.Q. (1953). Convergence: an accelerated longitudinal approach. *Chil Dev*, 24: 145-152.
26. Bergh, C., Eklund, T., Sodersten, P., & Nordin, C. (1997). Altered dopamine function in pathological gambling. *Psychological Medicine*, 27, 473-475
27. Berglund, M. (1988). Alcoholics committed to treatment: A prospective long-term study of behavioral characteristics, mortality, and social adjustment. *Alcoholism: Clinical & Experimental Research*, 12, 19-24.
28. Bergmark, K. H. & Andersson, T. (1999). The development of advanced drinking habits in adolescence--a longitudinal study. *Substance Use & Misuse*, 34, 171-194.
29. Blanco, C., Orensanz-Munoz, L., Blanco-Jerez, C., & Saiz-Ruiz, J. (1996). Pathological gambling and platelet MAO activity: a psychobiological study. *American Journal of Psychiatry*, 153, 119-121.

30. Blane, D., Harding, S., & Rosato, M. (1999). Does social mobility affect the size of the socioeconomic mortality differential?: Evidence from the Office for National Statistics Longitudinal Study. *Journal of the Royal Statistical Society Series A-Statistics in Society*, 162, 59-70.
31. Blaszczyński, A., Dumalo, V. & Lange, M. (1997). "How much do you spend gambling?" Ambiguities in survey questionnaire items. *Journal of Gambling Studies*, 13(3), 237-250.
32. Blaszczyński A, Nower L (2002). A pathway model of problem and pathological gambling. *Addiction*, 97: 487-499.
33. Boehnke, K. (2000). What is a cohort and why?--An old question revisited. In L.J.Crockett (Ed.), (2000). *Negotiating adolescence in times of social change* (pp. 256-264). x, 309pp.
34. Boots-Miller, B., Ribisl, K., Mowbray, C., Davidson, W., Walton, M. & Herman, S. (1998). Methods of ensuring high follow-up rates: Lessons from a longitudinal study of dual diagnosed participants. *Substance Use and Misuse*, 33, 2665-2685.
35. Bourdieu, P. & Passeron, J.C. (1990). *Reproduction in Society, Education and Culture*. Newbury Park, CA: Sage.
36. Bovasso, G. (2001). The long-term treatment outcomes of depression and anxiety comorbid with substance abuse. *Journal of Behavioral Health Services & Research*, 28, 42-57.
37. Boyle, M. H. & Willms, J. D. (2001). Multilevel modelling of hierarchical data in developmental studies. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 42, 141-162.
38. Bradizza, C. M., Reifman, A., & Barnes, G. M. (1999). Social and coping reasons for drinking: Predicting alcohol misuse in adolescents. *Journal of Studies on Alcohol*, 60, 491-499.
39. Brennan, P. A., Grekin, E. R., & Mortensen, E. L. (2002). Relationship of maternal smoking during pregnancy with criminal arrest and hospitalization for substance abuse in male and female adult offspring. *The American Journal of Psychiatry*, 159, 48-54.
40. Buchanan, A., Ten Brinke, J., & Flouri, E. (2000). Parental background, social disadvantage, public "care," and psychological problems in adolescence and adulthood. *Journal of the American Academy of Child & Adolescent Psychiatry*, 39, 1415-1423.
41. Carbonneau, R., Tremblay, R. E., Vitaro, F., Dobkin, P. L., Saucier, J., & Pihl, R. O. (1998). Paternal alcoholism, paternal absence and the development of problem behaviors in boys from age six to twelve years. *Journal of Studies on Alcohol*, 59, 387-398.
42. Cardone, S., Anderson, C., Sedlacek, J. & Fazio, P. (1997). The design and implementation of a gambling addiction program within a substance abuse agency. *Psychiatric Rehabilitation Skills*, 2(1):49-66.
43. Cattarello, Anne M. (2000). Community-level influences on individuals' social bonds, peer associations, and delinquency: A multilevel analysis. *Justice Quarterly*, 17(1):33-60.
44. Celentano, D. D., Munoz, A., Cohn, S., & Vlahov, D. (2001). Dynamics of behavioral risk factors for HIV/AIDS: A 6-year prospective study of injection drug users. *Drug and Alcohol Dependence*, 61, 315-322.

45. Chambers, J., Power, K., Loucks, N., & Swanson, V. (2001). The Interaction of Perceived Maternal and Paternal Parenting Styles and Their Relation with the Psychological Distress and Offending Characteristics of Incarcerated Young Offenders. *Journal of Adolescence*, 24(2): 209-227.
46. Chen, K., Scheier, L. M., & Kandel, D. B. (1996). Effects of chronic cocaine use on physical health: A prospective study in a general population sample. *Drug and Alcohol Dependence*, 43, 23-37.
47. Clarke, D. (2003). Gambling and the trait of addiction in a sample of New Zealand university students. *New Zealand Journal of Psychology*, 32(1): 39-48.
48. Claus, R.E., Kindleberger, L.R. & Dugan, M.C. (2002). Predictors of attrition in a longitudinal study of substance abusers. *Journal of Psychoactive Drugs*, 34, 69-74.
49. Collins L.M., Horn J.L. (Eds.). (1991). *Best methods for the analysis of change*. Washington DC: American Psychological Association.
50. Collins, R.L., Ellicson, P.L., Hays, R.D., & McCaffrey, D.F. (2000). Effects of incentive size and timing on response rates to a follow-up wave of a longitudinal mailed survey. *Evaluation Review*, 24, 347-63.
51. Comings, D. (1998). The molecular genetics of pathological gambling. *CNS Spectrums*, 3, 20-37.
52. Cotter, R.B., Burke, J.D., Loeber, R., Navratil, J.L. (2002). Innovative retention methods in longitudinal research: A case study of the developmental trends study. *Journal of Child and Family Studies*, 11, 485-498.
53. Connolly, J. J. (1991). Longitudinal studies of personality, psychopathology, and social behavior. In D.G.Gilbert (Ed.), (1991). *Personality, social skills, and psychopathology: An individual differences approach. Perspectives on individual differences.* (pp. 19-47). xiv, 296pp (pp. -47). xiv, 296pp.
54. Conrad, K. J., Hultman, C. I., Pope, A. R., Lyons, J. S., Baxter, W. C., Daghestani, A. N. et al. (1998). Case managed residential care for homeless addicted veterans: Results of a true experiment. *Medical Care*, 36, 40-53.
55. Cottler, L.B. & Cunningham-Williams, R. (1998). *The 11-year incidence of gambling problems among drug users recruited from the St. Louis ECA Study*. Presented, National Academy of Social Services Workshop on the Social and Economic Impact of Gambling. Washington DC, June 1998.
56. Crockford, D. & el-Guebaly, N. (1998). Psychiatric comorbidity in pathological gambling: A critical review. *Canadian Journal of Psychiatry*, 43, 43-50.
57. De Li, S. (1999). Social control, delinquency, and youth status achievement: A developmental approach. *Sociological Perspectives*, 42, 305-324.

58. Del Boca, F.K. & Noll, J.A. (2000). Truth or consequences: the validity of self-report data in health services research on addictions. *Addiction*, 95, S347-S360.
59. DeWit, D. J., Silverman, G., Goodstadt, M., & Stoduto, G. (1995). The construction of risk and protective factor indices for adolescent alcohol and other drug use. *Journal of Drug Issues*, 25, 837-863.
60. Dickerson, M. (2003). The evolving contribution of gambling research to the addiction theory. *Addiction*, 98(6):709.
61. Dickerson, M (2003). Exploring the limits of responsible gambling: Harm minimization or consumer protection? *Journal of the National Association for Gambling Studies*, 15(1), 29-44.
62. Dickerson, M. & Baron, E. (2000). Contemporary issues and future directions for research into pathological gambling. *Addiction*, 95, 1145-1159.
63. DiClementi, C. C., Story, M., & Murray, K. (2000). On a roll: The process of initiation and cessation of problem gambling among adolescents. *Journal of Gambling Studies*, 16, 289-313.
64. Division of Addictions, Harvard Medical School (2004). Developing new screening instruments: A look at the CPGI. *The Wager* 9(3): 1-4.
65. Dobkin, P. L., Tremblay, R. E., Masse, L. C., & Vitaro, F. (1995). Individual and peer characteristics in predicting boys' early onset of substance abuse: A seven-year longitudinal study. *Child Development*, 66, 1198-1214.
66. Dontas, A. S., Tzonou, A., Kasvikicharvati, P., Georgiades, G. L., Christakis, G., & Trichopoulos, D. (1991). Survival in A Residential Home - An 11-Year Longitudinal-Study. *Journal of the American Geriatrics Society*, 39, 641-649.
67. Edelbrock, C. (1994). Assessing child psychopathology in developmental follow-up studies. In S.L.Friedman (Ed.), (1994). *Developmental follow-up: Concepts, domains, and methods* (pp. 183-196). xxiii, 406pp.
68. el-Guebaly N, Hodgins D. (2000). *Pathological gambling: biopsychosocial dimension and treatment*. Alberta Gaming research Institute; www.abgaminginstitute.ualberta.ca.
69. Ellickson, P. L., Tucker, J. S., Klein, D. J., & McGuigan, K. A. (2001). Prospective risk factors for alcohol misuse in late adolescence. *Journal of Studies on Alcohol*, 62, 773-782.
70. Ellickson, P. L., Tucker, J. S., & Klein, D. J. (2001). High-risk behaviors associated with early smoking: results from a 5-year follow-up. *Journal of Adolescent Health*, 28, 465-473.
71. Elliott, D. (1999). National Youth Survey [United States]: Wave VII, 1987. Inter-University Consortium for Political and Social Research. Retrieved April 4, 2003 from: <http://www.icpsr.umich.edu:8080/NACJD-SERIES/00088.xml>
72. Farrington, D. P. (1991). Longitudinal research strategies: Advantages, problems, and prospects. *Journal of the American Academy of Child & Adolescent Psychiatry*, 30, 369-374.
73. Farrington, D. P. (1995). The Twelfth Jack Tizard Memorial Lecture: The development of offending and antisocial behaviour from childhood: Key findings from the Cambridge Study in

Delinquent Development. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 36, 929-964.

74. Fawer, C. L., Besnier, S., Forcada, M., Buclin, T., & Calame, R. (1995). Influence of perinatal, developmental and environmental factors on cognitive abilities of preterm children without major impairments at 5 years. *Early Human Development*, 43, 151-164.
75. Ferdinand, R. F., Bluem, M., & Verhulst, F. C. (2001). Psychopathology in adolescence predicts substance use in young adulthood. *Addiction*, 96, 861-870.
76. Ferdinand, R. F., Verhulst, F. C., & Wiznitzer, M. (1995). Continuity and change of self-reported problem behaviors from adolescence into young adulthood. *Journal of the American Academy of Child & Adolescent Psychiatry*, 34, 680-690.
77. Fergusson, D. M. & Horwood, L. J. (1998). Exposure to interparental violence in childhood and psychosocial adjustment in young adulthood. *Child Abuse & Neglect*, 22, 339-357.
78. Fergusson, D.M., & Harwood, L.J. (2001). The Christchurch Health and Development Studies: Review of findings on child and adolescent mental health. *Australian & New Zealand Journal of Psychiatry*, 35 (3), 287-296.
79. Fergusson, D. M., Horwood, L. J., & Woodward, L. J. (2001). Unemployment and psychosocial adjustment in young adults: Causation or selection? *Social Science & Medicine*, 53, 305-320.
80. Fergusson, D. M. & Woodward, L. J. (2002). Mental health, educational, and social role outcomes of adolescents with depression. *Archives of General Psychiatry*, 59, 225-231.
81. Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1994). Parental separation, adolescent psychopathology, and problem behaviors. *Journal of the American Academy of Child & Adolescent Psychiatry*, 33, 1122-1131.
82. Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1994). The childhoods of multiple problem adolescents: A 15-year longitudinal study. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 35, 1123-1140.
83. Fergusson, D. M. & Lynskey, M. T. (1996). Adolescent resiliency to family adversity. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 37, 281-292.
84. Ferris, J. & Wynne, H. (2001). *The Canadian Problem Gambling Index final report*. Phase II final report to the Canadian Inter-Provincial Task Force on Problem Gambling.
85. Ferris, J., Wynne, H. & Single, E. (1999). Measuring problem gambling in Canada: Final Report. *Canadian Centre on Substance Abuse*, Ontario, CCSA.
86. Fischer, S. (2000). Developing the DSM IV criteria to identify adolescent problem gambling in non-clinical populations. *Journal of Gambling Studies*, 16, 253-273.
87. Galaif, E. R., Stein, J. A., Newcomb, M. D., & Bernstein, D. P. (2001). Gender differences in the prediction of problem alcohol use in adulthood: Exploring the influence of family factors and childhood maltreatment. *Journal of Studies on Alcohol*, 62, 486-493.

88. Garnier, H. E. & Stein, J. A. (2002). An 18-year model of family and peer effects on adolescent drug use and delinquency. *Journal of Youth and Adolescence*, 31, 45-57.
89. Ghodsian, M. & Power, C. (1987). Alcohol consumption between the ages of 16 and 23 in Britain: A longitudinal study. *British Journal of Addiction*, 82, 175-180.
90. Glenn ND. Cohort analysis. Beverly Hills, CA: Sage 1977.
91. Gotham, H. J., Sher, K. J., & Wood, P. K. (1997). Predicting stability and change in frequency of intoxication from the college years to beyond: Individual-difference and role transition variables. *Journal of Abnormal Psychology*, 106, 619-629.
92. Griffin, K. W., Botvin, G. J., Epstein, J. A., Doyle, M. M., & Diaz, T. (2000). Psychosocial and behavioral factors in early adolescence as predictors of heavy drinking among high school seniors. *Journal of Studies on Alcohol*, 61, 603-606.
93. Griffiths, M. D. (1990). The acquisition, development, and maintenance of fruit machine gambling in adolescents. *Journal of Gambling Studies*, 6, 193-204.
94. Griffiths, M. & Wood, R. T. A. (2000). Risk factors in adolescence: The case of gambling, videogame playing, and the Internet. *Journal of Gambling Studies*, 16, 199-225.
95. Gupta, R. & Derevensky, J. L. (2000). Adolescents with gambling problems: From research to treatment. *Journal of Gambling Studies*, 16, 315-342.
96. Harford, T. C. & Parker, D. A. (1994). Antisocial behavior, family history, and alcohol dependence symptoms. *Alcoholism: Clinical & Experimental Research*, 18, 265-268.
97. Harford, T. C. & Muthen, B. O. (2000). Adolescent and young adult antisocial behavior and adult alcohol use disorders: A fourteen-year prospective follow-up in a national survey. *Journal of Studies on Alcohol*, 61, 524-528.
98. Hawkins, Darnell F. (1995). *Ethnicity, Race, and Crime: Perspectives Across Time and Place*. Albany, NY: State University of New York Press.
99. Hawkins, J. D., Graham, J. W., Maguin, E., Abbott, R., Hill, K. G., & Catalano, R. F. (1997). Exploring the effects of age alcohol use initiation and psychosocial risk factors on subsequent alcohol misuse. *Journal of Studies on Alcohol*, 58, 280-290.
100. Hedeker, D. & Mermelstein, R. J. (2000). Analysis of longitudinal substance use outcomes using ordinal random-effects regression models. *Addiction*, 95, S381-S394.
101. Hodgins, D.C., Currie, S.R., el-Guebaly, N. & Peden, N. Brief motivational treatment for problem gambling. 24-month follow-up. *Psychology of Addictive Behaviors*. [In Press].
102. Hodgins, D.C., el-Guebaly, N., Armstrong, S. & Dufour, M. (1999). Implications of depression on outcome from alcohol dependence: A 3-year prospective follow-up. *Alcoholism: Clinical and Experimental Research*, 23, 151-157.

103. Hoffman, J. H., Barnes, G. M., Welte, J. W., & Dintcheff, B. A. (2000). Trends in combinational use of alcohol and illicit drugs among minority adolescents, 1983-1994. *American Journal of Drug & Alcohol Abuse*, 26, 311-324.
104. Holder, H. D. & Blose, J. O. (1992). The reduction of health care costs associated with alcoholism treatment: A 14-year longitudinal study. *Journal of Studies on Alcohol*, 53, 293-302.
105. Hope, J. & Havir, L. (2002). You bet they're having fun! Older Americans and Casino Gambling. *J Aging Studies*, 16: 177-197.
106. Hser, Y. I., Hoffman, V., Grella, C. E., & Anglin, M. D. (2001). A 33-year follow-up of narcotics addicts. *Archives of General Psychiatry*, 58, 503-508.
107. Jackson, K. M., Sher, K. J., & Wood, P. K. (2000). Prospective analysis of comorbidity: Tobacco and alcohol use disorders. *Journal of Abnormal Psychology*, 109, 679-694.
108. Jacob, T. & Windle, M. (2000). Young adult children of alcoholic, depressed, and nondistressed parents. *Journal of Studies on Alcohol*, 61, 836-844.
109. Jacobson, K. C. & Rowe, D. C. (1999). Genetic and environmental influences on the relationships between family connectedness, school connectedness, and adolescent depressed mood: Sex differences. *Developmental Psychology*, 35, 926-939.
110. Jennison, K. M. & Johnson, K. A. (1998). Alcohol dependence in adult children of alcoholics: Longitudinal evidence of early risk. *Journal of Drug Education*, 28, 19-37.
111. Johnson, R., Jang, S.J., Larson, D.B., & Li, S. (2001). Does Adolescent Religious Commitment Matter? A Reexamination of the Effects of Religiosity on Delinquency. *Journal of Research in Crime and Delinquency*, 38, (1): 22-44
112. Johnson, V. & Pandina, R. J. (1993). The longitudinal examination of the relationships among stress, coping strategies, and problems associated with alcohol use. *Alcoholism: Clinical & Experimental Research*, 17, 696-702.
113. Johnson, V. & Bennett, M. E. (1995). Assessing and tracking family histories of alcoholism. *Journal of Studies on Alcohol*, 56, 654-660.
114. Johnson, V. & Pandina, R. J. (2000). Alcohol problems among a community sample: Longitudinal influences of stress, coping, and gender. *Substance Use & Misuse*, 35, 669-686.
115. Jones, R., Zhou, M., Yates, W.R. (2000). Improving return rates for health-care outcome. *Psychological Reports*, 87, 639-642.
116. Jordan, T.E. (1994). The arrow of time: Longitudinal study and its applications. *Genetic, Social and General Psychology Monographs. Heldrof Publications*;120(4), 469-531.
117. Jordan, T.E. (1980). Relationships among predictors in longitudinal data: Temporal-sequential analysis – TSAR. *Multiple Linear Regression Viewpoints*; 10, 15-28.

118. Jorm, A. F., Duncan-Jones, P., & Scott, R. (1989). An analysis of the re-test artefact in longitudinal studies of psychiatric symptoms and personality. *Psychological Medicine*, 19, 487-493.
119. Kandel, D. B. & Conrad, K. J. (2000). Types of marijuana users by longitudinal course. *Journal of Studies on Alcohol*, 61, 367-378.
120. Kaskutas, L. A., Weisner, C., & Caetano, R. (1997). Predictors of help seeking among a longitudinal sample of the general public, 1984-1992. *Journal of Studies on Alcohol*, 58, 155-161.
121. Kennedy, B.P., Kawachi, I., Prothrow-Stith, D., Lochner, K., & Gupta, V. (1998). Social Capital, Income Inequality, and Firearm Violent Crime. *Social Science and Medicine*, 47(1): 7-17.
122. Kiernan, K. E. (1997). Becoming a young parent: A longitudinal study of associated factors. *British Journal of Sociology*, 48, 406-428.
123. Kirkpatrick, L.A. (1993). Fundamentalism, Christian orthodoxy and intrinsic religious orientation as predictors of discriminatory attitudes. *Journal for the Scientific Study of Religion*. 32:256-268.
124. Kubicka, L., Csemy, L., & Kozeny, J. (1995) Prague women's drinking before and after the "Velvet Revolution" of 1989: A longitudinal study. *Addiction* 90:1471-1478.
125. Lavoie, F., Hebert, M., Tremblay, R., Vitaro, F., Vezina, L., & McDuff, P. (2002). History of family dysfunction and perpetration of dating violence by adolescent boys: A longitudinal study. *Journal of Adolescent Health*, 30, 375-383.
126. Lehman, W. E. & Joe, G. W. (1987). Longitudinal behavior as a predictor of follow-up outcomes for opioid addicts. *Psychology of Addictive Behaviors*, 1, 173-184.
127. Levin, J. S. & Taylor, R. J. (1998). Panel analyses of religious involvement and well-being in African Americans: Contemporaneous vs. longitudinal effects. *Journal for the Scientific Study of Religion*, 37, 695-709.
128. Lewis, S. K., Ross, C. E., & Mirowsky, J. (1999). Establishing a sense of personal control in the transition to adulthood. *Social Forces*, 77, US.
129. Lindahl, K. M., Clements, M., & Markman, H. (1997). Predicting marital and parent functioning in dyads and triads: A longitudinal investigation of marital processes. *Journal of Family Psychology*, 11, 139-151.
130. Loeber, R. & Farrington, D. P. (1994). Problems and solutions in longitudinal and experimental treatment studies of child psychopathology and delinquency. *Journal of Consulting & Clinical Psychology*, 62, 887-900.
131. Loeber, R, Farrington, D.P. (1995). Longitudinal approaches in epidemiological research of conduct problems. In F.C. Verhulst & H.M. Koot (Eds.). *The Epidemiology of Child and Adolescent Psychopathology*. Oxford: Oxford University Press.

132. Lynskey, M. T., Fergusson, D. M., & Horwood, L. J. (1994). The effect of parental alcohol problems on rates of adolescent psychiatric disorders. *Addiction*, 89, 1277-1286.
133. Maloney, W.H. & Robert, J.K. (2000). Notes on school-based crime fighting: International lessons in moral education. *Journal of Social Distress and the Homeless*, 9(2): 71-90.
134. Maser, J. D., Akiskal, H. S., Schettler, P., Scheftner, W., Mueller, T., Endicott, J. et al. (2002). Can temperament identify affectively ill patients who engage in lethal or near-lethal suicide behavior? A 14-year prospective study. *Suicide & Life-Threatening Behavior*, 32, 10-32.
135. McAllister, I. and Makkai, T. (1991). Correcting for the underreporting of drug use in opinion surveys. *The International Journal of the Addictions*, 26, 945-961.
136. McCormick, R. (1993). Disinhibition and negative affectivity in substance abusers with and without a gambling problem. *Addictive Behaviors*, 18, 331-336.
137. McGee, R. & Williams, S. (2000). Does low self-esteem predict health compromising behaviors among adolescents? *Journal of Adolescence*, 23, 569-582.
138. Mednick, S.A., Griffith, J.J., Mednick, B.R. (1981). Problems with traditional strategies in mental health research. In F. Schulsinger, S.A. Mednick & J. Knop (Eds.). *Longitudinal Research: Methods and Uses in Behavioral Science*. Boston: Martinus Nijhoff Publishing.
139. Millman, E. J. (2001). The mental health and biosocial context of help-seeking in longitudinal perspective: The Midtown Longitudinal Study. *American Journal of Orthopsychiatry*, 71, 450-456.
140. Mobilia, P. (1993). Gambling as a rational addiction. *Journal of Gambling Studies*. 9(2): 121-151.
141. Monks, J. (2000). The returns to individual and college characteristics Evidence from the National Longitudinal Survey of Youth. *Economics of Education Review*, 19, 279-289.
142. Morrisson, T.C., Wahlgren, D.R., Hovell, M.F., Zakarian, JU., Burhman-Kreitner, S., Hofstetter, C.R., Slymen, D.J., Keating, K., Russos, S., & Jones, J.A. (1997). Tracking and follow-up of 16,915 adolescents: minimizing attrition bias. Controlled Clinical Trials, 18, 383-96.
143. Muetzell, S. (1994). Mortality, suicide, social maladjustment and criminality among male alcoholic parents and men from the general population and their offspring. *International Journal of Adolescence & Youth*, 4, 305-328.
144. Muetzell, S. (1995). Are boys more vulnerable than girls in alcoholic families? *Early Child Development & Care*, 105, 43-58.
145. Muthen, B. O. & Muthen, L. K. (2000). The development of heavy drinking and alcohol-related problems from ages 18 to 37 in a U.S. national sample. *Journal of Studies on Alcohol*, 61, 290-300.
146. Nader, Philip R., Elaine J. Stone, Leslie A. Lytle, Cheryl L. Perry, Stavroula K. Osganian, Steve Kelder, Larry S. Webber, John P. Elder, Deanna Montgomery, Henry A. Feldman, Margaret

- Wu, Carolyn Johnson, Guy S. Parcel, and Russell V. Luepker. (1999). Three-Year Maintenance of Improved Diet and Physical Activity. *Archives of Paediatrics and Adolescent Medicine*. 153(7): 695-704.
147. National Research Council. (1999). *Pathological gambling. A critical review*. National Academy Press, Washington DC.
 148. Neve, R. J. M., Diederiks, J. P. M., Knibbe, R. A. & Drop, M. J. (1993) Developments in drinking behavior in the Netherlands from 1958 to 1989: a cohort analysis. *Addiction*, 88, 611–621.
 149. Newcomb, M. D. & Bentler, P. M. (1986). Frequency and sequence of drug use: A longitudinal study from early adolescence to young adulthood. *Journal of Drug Education*, 16, US.
 150. Newcomb, M. D. (1997). Psychosocial predictors and consequences of drug use: A developmental perspective within a prospective study. *Journal of Addictive Diseases*, 16, 51-89.
 151. Nordstrom, B. L., Kinnunen, T., Utman, C. H., Krall, E. A., Vokonas, P. S., & Garvey, A. J. (2000). Predictors of continued smoking over 25 years of follow-up in the normative aging study. *American Journal of Public Health*. 90, 404-406.
 152. O'Neill, S. E. & Sher, K. J. (2000). Physiological alcohol dependence symptoms in early adulthood: A longitudinal perspective. *Experimental & Clinical Psychopharmacology*, 8, 493-508.
 153. Orford, J., Morison, V. & Somers, M. (1996). Drinking and gambling: A comparison with implications for theories of addiction. *Drug and Alcohol Review*, 15(1):47-56.
 154. Ostir, G. V. (2001). Emotional well-being and subsequent health, functional ability, and mortality in older non-Hispanic Whites, Blacks, and Mexican Americans. *Dissertation Abstracts International, A (Humanities and Social Sciences)*, 61, 2865.
 155. Oyefeso, A., Ghodse, H., Clancy, C., Corkery, J., & Goldfinch, R. (1999). Drug abuse-related mortality: A study of teenager addicts over a 20-year period. *Social Psychiatry & Psychiatric Epidemiology*, 34, 437-441.
 156. Pagani, L., Tremblay, R. E., Vitaro, F., & Parent, S. (1998). Does preschool help prevent delinquency in boys with a history of perinatal complications? *Criminology*, 36, 245-267.
 157. Pandina, R. J. & Johnson, V. (1990). Serious alcohol and drug problems among adolescents with a family history of alcoholism. *Journal of Studies on Alcohol*, 51, 278-282.
 158. Perreira, K. M. & Smart, D. (2001). Life events and alcohol consumption among mature adults: A longitudinal analysis. *Journal of Studies on Alcohol*, 62, 501-508.
 159. Petry, M. (2003). Validity of a gambling scale for the Addiction Severity Index. *Journal of Nervous and Mental Disease*, 191(6): 399-407.

160. Prescott, C. A. & Kendler, K. S. (2001). Associations between marital status and alcohol consumption in a longitudinal study of female twins. *Journal of Studies on Alcohol*, 62, 589-604.
161. Price, R. K., Risk, N. K., & Spitznagel, E. L. (2001). Remission from drug abuse over a 25-year period: Patterns of remission and treatment use. *American Journal of Public Health*, 91, 1107-1113.
162. Prior, M., Smart, D., Snason, A., & Oberklaid, F. (2001). Longitudinal predictors of behavioral adjustment in pre-adolescent children. *Australian & New Zealand Journal of Psychiatry*, 35, 297-307.
163. Raudenbush, S. W. (2001). Comparing personal trajectories and drawing causal inferences from longitudinal data. *Annual Reviews in Psychology*, 52, 501-525.
164. Robins, L.N. (1980). Longitudinal methods in the study of normal and pathological developments. In F. Earls (Ed.). *Studies of Children* (pp. 34-83). New York: Prodist.
165. Rosecrance, J. (1985). *The Degenerates of Lake Tahoe*. Peter Lang, New York.
166. Rosenfeld, Richard, Steven F. Messner, and Eric P. Baumer. (2001). Social Capital and Homicide. *Social Forces*, 80(1): 283-309.
167. Rossow, I. & Amundsen, A. (1995). Alcohol abuse and suicide: A 40-year prospective study of Norwegian conscripts. *Addiction*, 90, 685-691.
168. Rossow, I. & Amundsen, A. (1996). The disadvantage of being advantaged? On a social gradient in excess mortality among alcohol abusers. *Addiction*, 91, 1821-1830.
169. Roy, A., DeJong, J., & Linnoila, M. (1989). Extraversion in pathological gamblers. *Archives of General Psychiatry*, 46, 679-681.
170. Rutledge, P. C. & Sher, K. J. (2001). Heavy drinking from the freshman year into early young adulthood: The roles of stress, tension-reduction drinking motives, gender and personality. *Journal of Studies on Alcohol*, 62, 457-466.
171. Rutter, M. (1981). Longitudinal studies: A psychiatric perspective. In S.A. Mednick & A.E. Baert (Eds.). *Prospective Longitudinal Research: An Empirical Basis of the Primary Prevention of Psychosocial Disorders* (pp. 326-336). Oxford: Oxford University Press.
172. Rutter, M. (1994). Beyond longitudinal data: Causes, consequences, changes, and continuity. *Journal of Consulting & Clinical Psychology*, 62, 928-940.
173. Salyer, J., Geddes, N., Smith, C.S. & Mark, B.A. (1998). Commitment and communication: Keys to minimizing attrition in multisite longitudinal organizational studies. *Nursing Research*, 47, 123-125.
174. Schuckit, M. A. & Smith, T. L. (1996). An 8-year follow-up of 450 sons of alcoholic and control subjects. *Archives of General Psychiatry*, 53, 202-210.
175. Schuckit, M. A. (1995). A long-term study of sons of alcoholics. *Alcohol Health & Research World*, 19, 172-175.

176. Schulenberg, J., Wadsworth, K. N., O'Malley, P. M., & Bachman, J. G. (1996). Adolescent risk factors for binge drinking during the transition to young adulthood: Variable- and pattern-centered approaches to change. *Developmental Psychology*, 32, 659-674.
177. Schulsinger, F. e. a. (2003). A prospective study of young men a high risk for alcoholism: Social and psychological characteristics. *Archives of General Psychiatry*, 43, 755-760.
178. Seeman, M. & Lewis, S. (1995). Powerlessness, health and mortality: A longitudinal study of older men and mature women. *Social Science & Medicine*, 41, US.
179. Schaffer, H. J. & Hall, M.N. (2001). Updating and refining prevalence estimates of disordered gambling behavior in the United States and Canada. *Can J Public Health*, 92, 168-172.
180. Schrans, T., Schellinck, T. & Walsh, G. (2000). 2000 Regular VL players follow-up study: A comparative analysis of problem development & resolution. *Nova Scotia Department of Health Addiction Services Technical Report*.
http://www.gov.ns.ca/heal/downloads/VLPlayers_TechnicalReport.pdf
181. Shaffer H., & Kidman, R. (2003). Shifting perspectives on gambling and addiction. *Journal of Gambling Studies*, 19(1): 1-6.
182. Shaffer, H. J., LaBrie, R.A., LaPlante, D.A., Nelson, S.E.. & Stanton, M.V. (2004) The Road Less Travelled: Moving from Distribution to Determinants in the Study of Gambling Epidemiology. *Canadian Journal of Psychiatry*, 49 (8), 504-516.
183. Schaeffer, N.C. (2000). Asking questions about threatening topics: A selective overview. In A.A. Stone & J.S. Turkkan (eds.), *The science of self-report: Implications for research and practice* (pp 105-121). Mahwah, NJ: Erlbaum.
184. Sher, K. J., Bartholow, B. D., & Nanda, S. (2001). Short-and long-term effects of fraternity and sorority membership on heavy drinking: A social norms perspective. *Psychology of Addictive Behaviors*, 15, 42-51.
185. Sher, K. J., Bartholow, B. D., & Wood, M. D. (2000). Personality and substance use disorders: A prospective study. *Journal of Consulting & Clinical Psychology*, 68, 818-829.
186. Sher, K. J., Gershuny, B. S., Peterson, L., & Raskin, G. (1997). The role of childhood stressors in the intergenerational transmission of alcohol use disorders. *Journal of Studies on Alcohol*, 58, 414-427.
187. Sher, K. J. & Gotham, H. J. (1999). Pathological alcohol involvement: A developmental disorder of young adulthood. *Development & Psychopathology*, 11, 933-956.
188. Sher, K. J., Gotham, H. J., Erickson, D. J., & Wood, P. K. (1996). A prospective, high-risk study of the relationship between tobacco dependence and alcohol use disorders. *Alcoholism: Clinical & Experimental Research*, 20, 485-492.
189. Sher, K. J., Trull, T. J., Bartholow, B. D., & Vieth, A. (1999). Personality and alcoholism: Issues, methods and etiological processes. In K.E. Leonard & H. T. Blane (Eds.), *Psychological Theories of Drinking and Alcoholism. Second Edition* (pp. 54-105). New York: Guilford Press.

190. Sher, K.J., Wood, P.K. (1997). Methodological issues in conducting prospective research on alcohol-related behavior: a report from the field. In K.J. Bryant, M. Windle & S.G. West (Eds.). *The Science of Prevention*. Washington DC, American Psychological Association.
191. Slutske WS, Jackson KM & Sher KJ (2003). The natural history of problem gambling from age 18 to 29. *Journal Abnormal Psychology* 112(2); 263-274.
192. Sieving, R. E., Perry, C. L., & Williams, C. L. (2000). Do friendships change behaviors, or do behaviors change friendships? Examining paths of influence in young adolescents' alcohol use. *Journal of Adolescent Health*, 26, 27-35.
193. Smith, G. & Wynne, H. (2004). VLT Gambling in Alberta: A preliminary analysis. A report prepared for the Alberta Gaming Research Institute. Edmonton, AB.
194. Smith, G. & Wynne, H. (2002). *Measuring gambling and problem gambling in Alberta using the Canadian Problem Gambling Index*. A report prepared for the Alberta Gaming Research Institute. Edmonton, AB.
195. Stanger, C., Achenbach, T. M., & Verhulst, F. C. (1994). Accelerating longitudinal research on child psychopathology: A practical example. *Psychological Assessment*, 6, 102-107.
196. Statistics Canada & the Canadian Institutes of Health Research: Canadian Community Health Survey (CCHS), Cycle 1.2: Mental Health and Well-Being, May 2002.
197. Statistics Canada & Human Resources Development Canada (2000/2002) National Longitudinal Survey of Children and Youth, Cycle 4 (2000) & 5 (2002).
198. Stattin, H., Romelsjo, A., & Stenbacka, M. (1997). Personal resources as modifiers of the risk for future criminality: An analysis of protective factors in relation to 18-year-old boys. *British Journal of Criminology*, 37, England.
199. Steinberg, L. (2001). We know some things: Parent-adolescent relationships in retrospect and prospect. *Journal of Research on Adolescence*, 11, 1-19.
200. Stewart, Eric A., Ronald L. Simons, R and D. Conger, and Laura V. Scaramella. (2002). Beyond the Interactional Relationship between Delinquency and Parenting Practices: The Contribution of Legal Sanctions. *Journal of Research in Crime and Delinquency*, 39(1): 36-59.
201. Supple, A. J., Aquilino, W. S., and Wright, D. L. (1999). Collecting sensitive self-report data with laptop computers: Impact on the response tendencies of adolescents in a home interview. *Journal of Research on Adolescence*, 9, 467-488.
202. Swaim, R. C. (1991). Childhood risk factors and adolescent drug and alcohol abuse. *Educational Psychology Review*, 3, 363-398.
203. Tanskanen, A., Tuomilehto, J., Viinamaki, H., Vartiainen, E., Lehtonen, J., & Puska, P. (2000). Joint heavy use of alcohol, cigarettes and coffee and the risk of suicide. *Addiction*, 95, 1699-1704.

204. Tennstedt, S. L., Crawford, S., & McKinlay, J. B. (1993). Determining the pattern of community care: Is coresidence more important than caregiver relationship? *Journal of Gerontology*, 48, US.
205. Timko, C., Moos, R. H., Finney, J. W., & Lesar, M. D. (2000). Long-term outcomes of alcohol use disorders: Comparing untreated individuals with those in Alcoholics Anonymous and formal treatment. *Journal of Studies on Alcohol*, 61, 529-540.
206. Toneatto, T. (2002). Cognitive therapy for problem gambling. *Cognitive and Behavioral Practice*, 9, 191-199.
207. Toneatto, T. (2002). Cognitive therapy for problem gambling. *Cognitive and Behavioral Practice*, 9, 191-199.
208. Tourangeau, R. & Smith, T. W. (1996). Asking sensitive questions: The impact of data collection mode, question format, and question context. *Public Opinion Quarterly*, 60, 275-304.
209. Vaillant, G. E. (1996). A long-term follow-up of male alcohol abuse. *Archives of General Psychiatry*, 53, 243-249.
210. Vaillant, G. E. & Hiller-Sturmhöfel, S. (1996). The natural history of alcoholism. *Alcohol Health & Research World*, 20, 152-161.
211. van der Zouwen, J. and De Leeuw, E. D. (1990). The relationship between mode of administration and quality of data in survey research. *Bulletin de Methodologie Sociologique*, 29, 3-14.
212. van Os, J., Park, S. B. G., & Jones, P. B. (2001). Neuroticism, life events and mental health: Evidence for person-environment correlation. *British Journal of Psychiatry*, 178, s72-s77.
213. Verhulst, F. C. & Koot, H. M. (1991). Longitudinal research in child and adolescent psychiatry. *Journal of the American Academy of Child & Adolescent Psychiatry*, 30, 361-368.
214. Vitaro, F., Dobkin, P. L., Carbonneau, R., & Tremblay, R. E. (1996). Personal and familial characteristics of resilient sons of male alcoholics. *Addiction*, 91, 1161-1177.
215. Vitaro, F., Ladouceur, R., & Bujold, A. (1996). Predictive and concurrent correlates of gambling in early adolescent boys. *Journal of Early Adolescence*, 16, 211-228.
216. Volberg, R., Gerstein, D., Christiansen, E. & Baldridge, J. (2001). Assessing self-reported expenditures on gambling. *Managerial and Decision Economics*, 22: 77-96.
217. Wagner, U. & Zick, A. (1995). The relation of formal education to ethnic prejudice: Its reliability, validity and explanation. *European Journal of Social Psychology*, 25(1): 41-56.
218. Walker, B. (1989). Some problems with the concept of "gambling addiction": Should theories of addiction be generalized to include excessive gambling? *Journal of Gambling Behavior*, 5(3): 179-200.
219. Walker, M. (1992). *The Psychology of Gambling*. Oxford: Butterworth-Heinemann Ltd.

220. Warshaw, M. G., Dolan, R. T., & Keller, M. B. (2000). Suicidal behavior in patients with current or past panic disorder: Five years of prospective data from the HARvard/Brown Anxiety Research Program. *The American Journal of Psychiatry*, 157, 1876-1878.
221. Weiner, M. D., Pentz, M. A., Turner, G. E., & Dwyer, J. H. (2001). From early to late adolescence: Alcohol use and anger relationships. *Journal of Adolescent Health*, 28, 450-457.
222. Werner, E. E. (1994). Children of the Garden Island. In J.S.DeLoache (Ed.), (1994). *Current readings in child development (2nd ed.)* (pp. 1-7). vi, 266pp.
223. Wetherell.J.L., Gatz, M., & Pedersen, N. L. (2001). A longitudinal analysis of anxiety and depressive symptoms. *Psychology & Aging*, 16, 187-195.
224. Wierson, M. & Forehand, R. (1994). Introduction to special section: The role of longitudinal data with child pscyhopathology and treatment: Preliminary comments and issues. *Journal of Consulting & Clinical Psychology*, 62, 883-886.
225. Williams, R. & Wood, R. (2002). Proportion of gaming revenue derived from problem gamblers: Examining the issues in a Canadian context. *Analyses of Social Issues and Public Policy*, 4(1), 33-45.
226. Wills, T. A., Vaccaro, D., & McNamara, G. (1992). The role of life events, family support, and competence in adolescent substance use: A test of vulnerability and protective factors. *American Journal of Community Psychology*, 20, 349-374.
227. Windle, M. & Davies, P. T. (1999). Developmental theory and research. In K.E.Leonard & H. T. Blane (Eds.), *Psychological Theories of Drinking and Alcoholism. Second Edition* (pp. 164-202). New York: Guilford Press.
228. Winters, K.C. & Anderson, N. (2000) Gambling involvement and drug use among adolescents. *Journal of Gambling Studies*, 16(23),175-198
229. Winters, K. C., Stinchfield, R. D., Botzet, A., & Anderson, N. (2002). A prospective study of youth gambling behaviors. *Psychology of Addictive Behaviors*, 16, 3-9.
230. Winters, K.C., Stinchfield, R.D. & Fulkerson, J. (1993). Toward the development of an adolescent gambling problem severity scale. *Journal of Gambling Studies*, 9, 63-84.
231. Wolock, I., Sherman, P., Feldman, L. H., & Metzger, B. (2001). Child abuse and neglect referral patterns: A longitudinal study. *Children & Youth Services Review*, 23, 21-47.
232. Wood, M. D., Sher, K. J., & McGowan, A. K. (2000). Collegiate alcohol involmment and role attainment in early adulthood: Findings from a prospective high-risk study. *Journal of Studies on Alcohol*, 61, 278-289.
233. Woodward, L. J. & Fergusson, D. M. (2001). Life course outcomes of young people with anxiety disorders in adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40, 1086-1093.

- 234. World Health Organization (1997). Composite international diagnostic interview (CIDI, Version 2.1) Geneva, World Health Organization [WHO].
- 235. Wright, John Paul, Francis T. Cullen, and John D. Wooldredge. (2000). Parental Support and Juvenile Delinquency. *Contemporary Perspectives in Family Research*, 2: 139-161.
- 236. Wynne, H., Smith, G. & Volberg, R. (1994). *Gambling and problem gambling in Alberta*. Edmonton, AB: Report prepared for Alberta Lotteries and Gaming.
- 237. Wynne Resources. (1998). *Gambling and problem gambling in Alberta*. Edmonton, AB: Report prepared for the Alberta Alcohol and Drug Abuse Commission.