Fonds de recherche
sur la société
et la culture
Québec

Rapport de recherche
PROGRAMME ACTIONS CONCERTÉES

# APPENDIX 3

## METHODOLOGY

# Table of Contents

# Tables

### *SAMPLE SELECTION*

The universities had to meet the following criteria for inclusion: (1) be geographically situated in the Montreal Metropolitan Area, (2) had a Registrar, (3) had more than 1000 full-time degree undergraduates, (4) had students physically attend classes (i.e., online universities were excluded), (5) were non-military or religious, and (6) be publicly-funded. In total, 4 universities and 3 affiliated schools were selected: université de Montréal and its 2 affiliated schools, école des Hautes études commerciales (HEC) and école polytechnique; université du Québec à Montréal and école de technologie supérieure affiliated to the Quebec University Network; Concordia University; McGill University. These universities and affiliated schools represent a population of 85,789 undergraduate according to the Directory of Canadian Universities.

Eligible students included full-time undergraduates as well as those enrolled in professional schools such as Law and Medicine, but without an undergraduate degree. The size of the sample was calculated to insure statistical power and validity of research, denoting a margin of error of less than 5%.

### *PROCEDURE*

The project was approved by the Concordia University Ethics Committee and authorization was given by the Commission d'accès à l'information du Québec (CAI) to obtain and store students nominal information. The Office of the Registrar of each eligible university was contacted by telephone and subsequently by email to present the project and invite them to participate. No university required an additional REB approval from their institution. Upon university approval, a random sample of students was generated by university staff following the instruction provided by our research staff.

All students were mailed a package that included a paper copy of the questionnaire and a cover letter. The letter described the study goals and informed students that they could either complete and return the paper copy of the questionnaire by mail or complete it on-line on a secured website. Respondents were also assured that participation was voluntary and that their answers would remain completely confidential. They were also informed that their names would not be connected to their responses and that they could refuse to answer any question or interrupt their participation at any time with no penalty. In order to increase participation, a lottery incentive was employed. Students completing questionnaires had a chance to win one of four IPod nano.

Data collection, which included seven contacts with participants, occurred over an 8-week period between October 17 and December 12, 2008. (see Table. 1) Because participants were to be contacted on multiple occasions, special attention was given to the removal from the reminder list of those who had already completed the questionnaire. The data collection was closed on January 15, 2009.

*Table 1.* Contact and follow-up Schedule

| Date sent | Contact |
|---|---|
| 17-20 October | Letter, questionnaire, website and PIN# to all respondents |
| 23 October | Email reminder, website and PIN# to all respondents |
| 29 October | Letter reminder, website and PIN# to respondents who didn't answer |
| 7 November | Email reminder, website and PIN# to respondents who didn't answer |
| 12 November | Final letter reminder, website and PIN# to respondents who didn't answer |
| 28 November | Email reminder, website and PIN# to respondents who didn't answer |
| 12 December | Final email reminder, website and PIN# to respondents who didn't answer |
| 15 January | Web and Mail data collection closed |

The survey used a mixed-mode strategy, employing both web-based and mail-based completion methods. Even though they may generate measurement differences, the advantages are too numerous to limit oneself to one mode [1-3]. First, when conducted with a population that has easy access to Internet such as

university populations, Internet surveys have found results comparable to the standard mail mode [4]. Second, an experimental survey found that undergraduates were more likely to answer socially threatening items (e.g., forced intercourse, suicide attempts) using the web mode [5]. Third, offering mixed-mode strategies have become the method of choice to increase response rates as it offers alternatives to respondents' preference [3, 5].

Although conducting web-based surveys among university populations is one of the most feasible methods given their higher internet coverage rates [6], difficulties remain in obtaining full coverage sampling frames. A large percentage of students use personal and public internet services rather than the standard university domain name which compromise the capacity to generate a representative sample. For example, a University of Toronto dissertation found that only 53% of enrolled undergraduates had an active (last 12 months) email account using the university domain name [7]. Consequently, our sample was drawn from a frame based on postal addresses provided by each university.

### *Mail mode*

The mail questionnaire was 24 pages in length, printed in an 8 1/2" by 11" double-sided booklet format. Each questionnaire included a 6-digit user number on the front cover page, a consent form and consent for a follow-up study (see appendix 5). Respondents were provided a paid, business reply envelope in which to return completed copies of the paper questionnaire. Upon their return, the participant's name was removed from the follow-up list, and mailed questionnaires were given to Quali-Data for data entry. A double-check was done on all entries once the data base was completed.

### *Web mode*

The online survey was managed by MultiSpectra. The interface consisted of 14 sections based on the paper questionnaire and employed a software (WilliamWeb) that allowed a dynamic labeling and skip patterns. Students who chose web completion were instructed to go to a secured website where they were prompted to enter the unique 6-digit user number and the 6-digit password code found on their cover letter. After the first logon, they were asked to change the password for added security.

The on-line survey method allowed for several controls. Participants could either complete the questionnaire in English or in French. They could also stop the survey and return at a later date. For single response questions, respondents could provide only one response or could leave the question unanswered. Still, a message and highlighting of the question would appear to confirm if the skip was voluntary or just inattentiveness. In addition, skip patterns were programmed to direct respondents to specific questions. Respondents were provided with an email address and a phone number in case of problems accessing or completing the survey.

The web survey employed the interactive (non-scrollable) method. Respondents navigated through the questionnaire one screen at a time with usually several items and a radio button input. They were not able to view the whole questionnaire by scrolling but could backtrack to make changes to their answers. Quali-Data completed the merging of data generated through the web and by paper and pencil questionnaires.

In total, 718 students (33.5%) chose to complete the survey by mail, and 1,425 (66.5%) completed the survey online. Mode differences for outcome variables were generally nominal. Of 19 outcomes, 5 differed significantly at $p<.05$. Moreover,

confidence intervals between estimates for the two modes overlapped for all six differences.

### *Follow-Up study: Focus groups*

All participants to the survey were invited to take part of a follow-up study. In total, 30.4% accepted to be contacted to participate to the follow-up (n=650). Of all the individuals, 251 were non-gamblers, 282 were non-problem gamblers, 67 were low-risk gamblers, 24 were moderate-risk gamblers and 5 were problem gamblers. Of these groups, all the at-risk gamblers (low & moderate) and problem gamblers were contacted. Participation rate to follow up was of 20.9% for low-risk gamblers (n=13), 25% for moderate-risk gamblers (N=6) and 80% for problem gamblers (n=4). Initially, the methodology was to create focus groups based on the severity of gambling problems as measured by the *Canadian Problem Gambling Index* (non problem and low-risk gamblers, moderate-risk gamblers, problem gamblers) by randomly selecting participants in those groups with stratification on language and gender. However, because of the small number of participants who were identified as problem and moderate-risk gamblers, it was decided that individual interviews were to be used. Of the 26 individuals that took part in the follow-up study, individual interviews were conducted with moderate-risk gamblers (n=6) and problem gamblers (n=4) while low-risk gamblers and few non-problem gamblers were gathered in three focus groups (n=15) for group discussions. The interviews were semi-structured and tackled the following themes: gambling habits, motivations to gamble, gambling contexts, substance consumption while gambling, subjective experiences while gambling, enabling factors and risk perception. All participants to follow-up also completed the CPGI. Compensation was given to each individual for their participation.

## MEASURES

### Gambling

The gambling domain was divided into three sections: gambling activities, gambling contexts and gambling problems.

***Gambling activities.*** The gambling activities section was based on the *Canadian Problem Gambling Index* (CPGI) [8]. Conversely, the questions were divided by activity and not by type of question in order to explore in depth the characteristics of the contexts and the associated problems. In total, ten activities were elected for the questionnaire:

- Lottery tickets
- Horse or dog racing
- Bingo
- Video lottery Terminals (VLTs)/ coin slot machines
- Table Poker
- Table games
- Betting on sports/ sport events
- Card games / board games
- Games of skills
- Speculative investments

For each gambling activity, five questions were asked: 1) the frequency of gambling in all possible settings in the past 12 months ("During the past 12 months, how often did you bet or spend money on BINGO in the following locations", with choices being 'Internet', 'in a private residence', :'on campus', 'at work', 'in bingo Halls/Rooms", 'in a church basement', 'other'), 2) individuals with whom the participant gambled in the past 12 months ("During the past 12 months, with whom did you generally bet or spend money on BINGO?", with choices being 'alone', 'friends', 'family members', 'co-workers', 'other'), 3) the debt the participant accumulated due to this activity ("In the past 12 months, how much debt have you accumulated due to betting on BINGO?"), 4) the money typically spent in a month on this activity ("During the past 12 months, how much money on average did you spend per month on BINGO? Do not

include your winnings"), 5) problems that the activity caused with family, friends, work, finances and studies ("During the past 12 months, would you say that betting or spending money on BINGO has caused problems in your relationship with family members (mother, children, partner, etc.), relationship with friend(s), in your studies, your finances, your work").

***Recent gambling occasions.*** Participants were asked to describe the three most recent gambling occasions by providing information on the physical and social context in which they occurred, namely: 1) the type of gambling activity, 2) the location where the activity took place and whether it was on Internet, 3) the period of the week, 4) the time and money that was spent on gambling, 5) the number of gambling partners, 6) the reasons for which they gambled, 7) the number of alcoholic beverages that they had during that occasion, 8) whether they used cannabis or other illicit drugs during that occasion, and 9) whether they missed any class due to their gambling.

***Severity of gambling problems***. The problem gambling section is based on the CPGI [8], which psychometric characteristics has been shown to be satisfactory. The nine questions were answered on a four-point Likert scale ('never'; 'sometimes'; 'most of the time'; 'almost always') with a total score ranging for 0 to 27. Participants were categorized into one of four groups as non-problem gamblers (score = 0); at low-risk gamblers (score = 1 or 2); at moderate-risk gamblers (score = 3 to 7); problem gamblers (score ≥ 8).

### *Alcohol and drug use*

The alcohol and drug use domain included three sections: 1) alcohol consumption and patterns, 2) hazardous and harmful drinking, and 3) illicit drug use.

***Alcohol consumption and patterns.*** This sections contains eight questions that measure: 1) lifetime use of alcoholic drink; 2) age of first consumption; 3) frequency of alcohol use during the past 12 months, and past 30 days; 4) usual number of drinks on a typical occasion in the past 12 months, and the past 30 days; 5) number of excessive drinking occasions (5 drinks or more) in the past 12 months, and the past 30 days; 6) frequency of consumption during the last month.

***Hazardous and harmful drinking.*** The hazardous and harmful drinking was derived from the World Health Organization Alcohol Use Disorders Identification Test (AUDIT) screener [11]. The AUDIT, a 10-item questionnaire is a screening tool that identifies hazardous and harmful drinking patterns of drinking as well as alcohol dependence. We use the cut-off score of 8+ to identify hazardous and harmful patterns of drinking, and the cu-off of 11+ to identify alcohol dependence.

We also examined the percentage of students who report any of the 4 AUDIT alcohol-related harms and the percentage who report any of the 3 AUDIT dependence symptoms.

***Illicit (non-medical) drug use.*** A total of 15 questions were devised to assess the use of a list of illicit drugs on a 4-point scale ('When was the last time, if ever, that you used the following drugs?', the choices being 'never in my life', 'in my life but not in past 12 months', 'in past 12 month but not in past 30 days', 'in past 30 days'). Moreover, we assessed the frequency of cannabis use in the past 12 months ('How often have you used marijuana or hashish during the past 12 months?', the choices being 'almost every day', '4 to 5 times a week', '2 to 3 times a week', 'once a week', '2 to 3 times a month', 'once a month', 'less than once a month', 'never').

***Tobacco use.*** This section assessed current smoking status ('lifetime non-smoker'; 'previous smoker'; 'current occasional smoker'; 'current daily smoker') based on the four following questions: 1) lifetime use of tobacco ('Have you smoked at least 100 cigarettes in your life?'); 2) current use of tobacco ('At the present time, do you smoke cigarettes daily, occasionally or not at all?'); 3) time elapsed to first smoke in the morning ('In the past 30 days, how soon after you wake up in the morning do you usually smoke your first cigarette?').

### *Psychological distress*

The psychological distress is based on the General Health Questionnaire [GHQ] [12, 13]. The GHQ-12 examines components of psychological distress such as ability to cope with stress, depression, and self-confidence. This mental health screener, emphasizes changes during the past few weeks in symptom conditions (e.g., "more than usual", "much more than usual"), has been extensively used and validated. Students reporting 4 or more of the symptoms were considered to be in a state of poor mental health, or at an "elevated psychological distress".

### *Family history*

Family history assessed the presence of any problem involving alcohol, drug use and gambling that indicated treatment in the family. The questions inquired about four family members, namely the father, the mother, brothers and sisters.

### *Impulsivity and venturesomeness*

The impulsivity and venturesomeness section is based on Vitaro's adaptation of Eysenck Impulsivity Scale [15]. The instrument included 10 questions (i.e: 'Do you generally do and say things without stopping to think?') assessed the degree of impulsivity or venturesomeness on a scale ranging from between 1 ('not impulsive or adventurous') to 5 ('very impulsive or adventurous').

### *Socio-Demographics*

A set of questions collected socio-demographic information on respondents, including: 1) gender; 2) age; 3) marital status; 4) living arrangements; 5) place of birth and year of immigration for people born outside Canada; 6) language spoken at home; 7) ethnic membership; 8) field and year of study; 9) grade point average; 10) employment status; 11) number of close friends; 12) possession of a cell phone and available services for Internet connections

## *DATA AND SAMPLE QUALITY*

### *Data quality*

Furthermore, during the data cleaning, details analysis was undertaken to find invalid values, item non-response and all outliers. Each case was then treated individually and corrected if necessary. Minimally complete cases were defined by: 1) students who reported being a full-time undergraduate (ineligible part-time and graduate students were excluded) and 2) students who reported valid values for sex. This process resulted in 2,139 cases for analysis after the removal of 96 respondents.

### *Sample quality*

Response rates are a key feature of the data quality as the responses from participants can vary greatly from non-participants' responses, biasing the result from a survey. However, the magnitude of such problem depends on the size of the response rate and the differences between respondents and non-respondents [16]. Although only 41% of students completed the survey, this response rate is comparable to other large national university surveys such as the 2004 Canadian Campus Survey.

### *Weighting*

Two types of weights have been calculated to enable the generalisability of results to the population of full-time undergraduate students in Montreal. Thus, we have calculated one population weight and two sampling weights.

***Population weight.*** The calculation of the population weight was done in two steps: 1) the selection weight and the non-response rate, and 2) the post-stratification. We have calculated a selection weight for individuals that is equal to

the inverse of the probability of selection of a student in each university. The weight was also adjusted for the total non-response rate within universities.

Post-stratification was done according to gender in order to insure that the relative proportion of gender subgroups is equivalent to their relative proportion in the general student population. We also adjusted the sum of weights for men (comparatively to the sum of weights for women). Estimations for the post-stratification and the adjustment were produced from data provided by the Association of Universities and Colleges of Canada [17].

***Sampling weights.*** The sampling weight was obtained by dividing the population weight of each respondent by average of weights for all respondents. The sampling weight is essentially used to calculate the variance of proportions estimates.

Population estimates have been weighted using population weights whereas estimations of proportions have been weighted using sampling weights.

### *SAMPLE CHARACTERISTICS*

Table 2 revealed that respondents had a mean age of 22 years ranging between 17 and 51 and there were 1.7 women for each man. Respondents' year of study was distributed between 37% in first year, 27% in second year, 25% in third year and 12% in fourth year. A majority of respondents studied in Arts, Humanities & Social Sciences (48%) followed by Business & Commerce (22%), Science & Technology (18%) and Health Sciences (8%). Only 5% of students lived on campus and the rest off campus with 71.5% living with family, 15.3%, with friends, and 8.3%, alone. Most respondents were never married (81%); however, 18% were married or living with a partner and 1% reported being divorced, separated or widowed. About three-in four respondents (75%) were born in Canada and 25% were born outside Canada. It was estimated that 54% of survey questionnaires were completed in English and 46% in French.

*Table 2.* Sample characteristics (N=2,139)

| | N | Unweighted % | Weighted % |
|---|---|---|---|
| **GENDER** | | | |
| **Men** | 800 | 37.4 | 42.7 |
| **Women** | 1,339 | 62.6 | 57.3 |
| **MEAN AGE (RANGE 17 - 51)** | | 22.6 | 22.6 |
| **YEAR OF STUDY** | | | |
| **First** | 755 | 36.7 | 37.2 |
| **Second** | 553 | 26.8 | 27 |
| **Third** | 504 | 24.5 | 24.7 |
| **Fourth** | 248 | 12 | 11.1 |
| **AREA OF STUDY** | | | |
| **Arts/Humanities** | 491 | 23.9 | 23.2 |
| **Science/Technology** | 119 | 5.8 | 5.6 |
| **Engineering** | 243 | 11.8 | 9.8 |
| **Social Science** | 214 | 10.4 | 8.9 |
| **Business/Commerce** | 451 | 21.9 | 23.1 |
| **Medicine** | 50 | 2.4 | 2.9 |
| **Other Health Sciences** | 115 | 5.6 | 6.2 |
| **Law** | 45 | 2.2 | 2.8 |
| **Education** | 233 | 11.3 | 12.9 |
| **Other** | 95 | 4.6 | 4.6 |
| **LIVING ARRANGEMENT -WHERE** | | | |
| **University residence** | 78 | 3.8 | 3.9 |
| **Other university housing** | 24 | 1.2 | 1.5 |
| **Non-university housing** | 1,269 | 62.1 | 61.8 |
| **Other** | 673 | 32.9 | 32.8 |
| **LIVING ARRANGEMENT - WITH WHO** | | | |
| **Alone** | 204 | 10 | 9.7 |
| **With spouse/partner** | 342 | 16.7 | 17.4 |
| **With parents** | 989 | 48.3 | 47.8 |
| **With other family members** | 155 | 7.6 | 7.1 |
| **With friends/acquaintances** | 326 | 15.9 | 16.5 |
| **Other** | 33 | 1.6 | 1.6 |

| | | | |
|---|---|---|---|
| **MARITAL STATUS** | | | |
| **Married** | 101 | 4.9 | 4.6 |
| **De facto union (cohabitation)** | 274 | 13.3 | 14.2 |
| **Widowed** | 1 | 0.1 | 0 |
| **Separated** | 13 | 0.6 | 0.5 |
| **Divorced** | 8 | 0.4 | 0.4 |
| **Single, never married** | 1,667 | 80.8 | 80.3 |
| **BORN** | | | |
| **In Canada** | 1,553 | 75.4 | 77.6 |
| **Outside Canada** | 507 | 24.6 | 22.4 |
| **ETHNICITY** | | | |
| **Canada** | 1,187 | 57.7 | 62.6 |
| **United States** | 11 | 0.5 | 0.4 |
| **Mexico, Caribbean, or Latin America** | 90 | 4.4 | 3.9 |
| **Africa Central** | 91 | 4.4 | 5 |
| **West Europe (France, Spain, Sweden, etc.)** | 210 | 10.2 | 9.6 |
| **Asia (China, Japan, Laos, etc.)** | 178 | 8.6 | 6.7 |
| **Asia (India, Nepal, Pakistan, etc.)** | 36 | 1.8 | 1.2 |
| **Australia and Pacific Islands** | 0 | 0 | 0 |
| **Middle East (Saudi Arabia, Oman, Turkey, etc.)** | 97 | 4.7 | 4.2 |
| **Eastern Europe (Albania, Hungary, Russia, etc.)** | 93 | 4.5 | 3.6 |
| **Don't want to answer** | 38 | 1.9 | 1.8 |
| **Do not know** | 28 | 1.4 | 1.1 |
| **EMPLOYMENT STATUS** | | | |
| **Full-time employment** | 80 | 3.9 | 3.7 |
| **Part-time employment** | 1,173 | 57.1 | 58.1 |
| **No employment** | 748 | 36.4 | 35.7 |
| **Other** | 52 | 2.5 | 2.5 |
| **LANGUAGE SPOKEN AT HOME** | | | |
| **English only** | 243 | 11.8 | 7.4 |
| **French only** | 909 | 44.1 | 53.1 |
| **French and English** | 274 | 13.3 | 12.5 |
| **English and other only** | 136 | 6.6 | 4.6 |
| **French and other only** | 127 | 6.2 | 7.2 |
| **French, English and other** | 190 | 9.2 | 8 |
| **Other** | 183 | 8.9 | 7.3 |
| **SURVEY LANGUAGE** | | | |
| **English** | 1,144 | 53.5 | 57.6 |
| **French** | 995 | 46.5 | 42.4 |
| **SURVEY MODE** | | | |
| **Online** | 1,423 | 66.5 | 67.4 |
| **Mail** | 716 | 33.5 | 32.6 |

## *DERIVED VARIABLES USED IN REPORTED ANALYSES*

Below is a list of the derived variables that were used in the analyses reported in tables in Appendix 4. The description of those variables can be found in the derived variables codebook.

| MEASURE | DESCRIPTION |
|---|---|
| **Gambling patterns and problems** | |
| ***Gambling patterns*** | |
| Past year gamblers | This variable categorizes respondents into non-gamblers and gamblers during the last 12 months. Participants who provided negative answers on all gambling activities where categorized as non-gamblers whereas those who provided at least one positive answer on the 10 activities as gamblers. |
| Gambling profile | This variable has five-categories: "non-gamblers" from the gambling activities in the last 12 months variable and "non-problem gambler", "low risk gambler", "moderate risk gambler", "problem gambler" from the score on the CPGI. |
| Severity of gambling problems | This variable is based on the 9-item Canadian Problem Gambling Index (CPGI). The CPGI measures gambling problems in the general population and distinguishes between "non-problem" gamblers (score=0), those at "Low risk" of developing problems (score = 1 or 2), those with "Moderate" gambling problems (score = 3 to 7), and those with severe "Problems" (score = 8 or more" (Ferris and Wynne, 2001). |
| Gambling profile (recoded) | This variable was created by merging the "at-moderate risk gamblers" and "problem gamblers" categories of the severity of gambling problems variable. It resulted in a three category variable which distinguished between "non-problem gamblers", "gamblers at low risk" and "gamblers with moderate or severe problems". |
| Internet gambling | This variable categorized gamblers into Internet and non-Internet gamblers. Non-Internet gamblers are those who answered 'never' for gambling on Internet on all activities where this location is applicable. |
| Internet Poker gamblers | This variable divided Internet gamblers into those who played "online poker only" and those who played "online poker and/or other online activities". |
| Number of gambling activities | This variable assesses the total number of gambling activities that the individual played in the past 12 months. The variable was categorized into "one", "two", "three" and "four and more" activities. |
| ***Gambling locations*** | |
| Locations for each of the 10 activities | These variables were created to measure if gamblers played ("yes/no") in a particular location for each of the 10 gambling activities. Some locations were specific to certain activities (see appendix 5 for questionnaire) |
| Number of activities for each | This set of variables was created to measure the |

| | |
|---|---|
| location | number of activities (either "one" or "two or more") gamblers engaged in, in each location. The count resulted from any positive answer to the binary variable pertaining to that location. |
| Combined activities for each location | This set of variables was created to measure if a gambler played ("yes/no") in any given location. |
| Monthly gambling on activities in various locations | This set of variables assesses whether participants bet or spent money on a particular activity in a given location on a monthly basis ("yes";"no"). The category "Less than once a month" was contrasted with all the other categories ("1 to 4 times a month", "2 to 6 times a week" or "every day"). |
| ***Gambling problems*** | |
| Specific problems due to gambling | The variable assesses any reported problems due to gambling in four life arenas with family ("yes", "no"), friends ("yes", "no"), in studies ("yes", "no"), and/or finances ("yes", "no") for all 10 activities. |
| Specific problems due to specific gambling activity | The variable assesses any single reported problems (with family, friends, studies, finances) due to gambling for each one of the 10 gambling activities. |
| ***Spending and Debt*** | |
| Total spending | This variable measures the total spending on gambling by summing-up spending on all 9 gambling activities (excluding speculative investments). |
| Total spending (recoded) | Due to departure from normality of spending variable, the variable was recoded into five categories "$0 to $20", "$21 to $50", "$51 to $100", "$101 to $250" and "$250+". |
| Total debt | This variable measures total debt due to gambling by summing-up the reported debt for all 9 gambling activities (excluding speculative investments). |
| Total debt (recoded | Due to departure from normality of debt variable, the variable was recoded into five categories "$0 to $20", "$21 to $50", "$51 to $100", "$101 to $250" and "$250+". |
| **Drinking patterns and problems** | |
| ***Drinking patterns*** | |
| Current drinkers | This variable assesses whether participants reported drinking any alcoholic beverage over the past 12 months. |
| Past month drinkers | This variable assesses whether participants reported drinking any alcoholic beverage over the past 30 days. |
| Excessive drinking episodes (past 12 months | These binary variables were created to identify where respondents had consumed any of the following number of drinks on a single occasion in the past 12 months. The following categories were used: 1) 5 to 7 drinks, 2) 8 to 11 drinks, 3) 12 drinks or more. |
| Excessive drinking episodes (past 30 days | These binary variables were created to identify where respondents had consumed any of the following number of drinks on a single occasion in the past 30 days. The following categories were used: 1) 5 to 7 drinks, 2) 8 to 11 drinks, 3) 12 drinks or more. |
| Past 30 days drinkers' typology | This typology categorized respondents into one of the 6 |

| | |
|---|---|
| | categories: 1) lifetime abstainers (never had an alcoholic beverage in their life), 2) former drinkers (had an alcoholic beverage in their life, but not during the past 12 months), 3) drinkers (usually consume less than 5 drinks on days that they drink and drink less than once a week), light-frequent drinkers (usually consume less than 5 drinks on days that they drink and drink at least once a week), heavy-infrequent drinkers (usually consume 5 drinks or more on days that they drink and drink less than once a week), heavy-frequent drinkers (usually consume 5 drinks or more per day and drink at least once a week). |
| Five drinks or more on a single occasion once every two weeks over the past 12 months | The frequency of 5+ per occasion was derived from three questions: frequency of drinking at certain levels per occasion (between 5 and 7 drinks, between 8 and 11 drinks, 12 or more drinks) over the past 12 months. The summation of the responses to these questions was divided by 26 to estimate the bi-monthly frequency of 5+ over the past 12 months<br>. |
| Eight drinks or more on a single occasion once every two weeks over the past 12 months | The frequency of 8+ per occasion was derived from three questions: frequency of drinking at certain levels per occasion (between 8 and 11 drinks, 12 or more drinks) over the past 12 months. The summation of the responses to these questions was divided by 26 to estimate the bi-monthly frequency of 8+ over the past 12 months. |
| Five drinks or more on a single occasion once every two weeks over the past 30 days | The frequency of 5+ per occasion was derived from three questions: frequency of drinking at certain levels per occasion (between 5 and 7 drinks, between 8 and 11 drinks, 12 or more drinks) over the past 30 days. The summation of the responses to these questions was divided by 2 to estimate the bi-monthly frequency of 5+ over the past 30 days. |
| Eight drinks or more on a single occasion once every two weeks over the past 30 days | The frequency of 8+ per occasion was derived from three questions: frequency of drinking at certain levels per occasion (between 8 and 11 drinks, 12 or more drinks) over the past 30 days. The summation of the responses to these questions was divided by 2 to estimate the bi-monthly frequency of 8+ over the past 30 days. |
| ***Drinking problems*** | |
| AUDIT-harm | Reporting at least one of the 4 AUDIT harms<br>- feeling guilty or remorse<br>- experiencing memory loss after drinking<br>- reporting an alcohol-related injury<br>- concern of others' expressing concern about their drinking |
| AUDIT-dependence | Reporting at least one of the 3 AUDIT dependence symptoms<br>- being unable to stop drinking<br>- failing to perform normal activities<br>- needing a first drink in the morning |
| Hazardous or harmful drinking (AUDIT 8+) | Scoring 8 or higher on the total 10-item AUDIT scale. |
| Dependence (AUDIT 11+) | Scoring 11 or higher on the total 10-item AUDIT scale. |

| | |
|---|---|
| **Illicit (non-medical) drug use** | |
| Lifetime cannabis use | Reporting ever using cannabis in one's life. |
| Frequency of cannabis use in the past 12 months | Frequency of cannabis use over the past year ("never", "less than once a month", "2-3 times a month", " once a week", "2-3 times a week", "4-5 times a week", `every day"). |
| Past year cannabis use | Reporting using cannabis in the past 12 months (past year frequency measure recoded) |
| Past month cannabis use | Reporting using cannabis in the past 30 days (past year frequency measure recoded). |
| Lifetime cannabis use | Reporting ever using cannabis in one's life. |
| Lifetime illicit drug use (excluding cannabis) | Reporting any positive answer for the use of one of the 14 illicit drug categories |
| Past year illicit drug use | Reporting any positive answer for the use of one of the 14 illicit drug categories over the past year |
| Past month illicit drug use | Reporting any positive answer for the use of one of the 14 illicit drug categories over the past 30 days |
| **Smoking status** | |
| Smoking status | This variable includes 4 categories of smokers: 1) "non-smokers" (respondents who reported not having smoked 100 cigarettes in their lifetime, 2) "previous smokers" (those who reported having smoked 100 cigarettes in their lifetime but not currently smoking), 3) "occasional smokers" are those who reported having smoked 100 cigarettes in the lifetime and who reported currently smoking on occasions), 4) "daily smokers" are respondents who reported having smoked 100 cigarettes in their lifetime and currently smoked every day). |
| **Psychological Distress** | |
| Psychological distress | This binary variable was derived from the total score on the General Health Questionnaire (GHQ-12). For this variable, a cut-off point of 4 was used to distinguish between respondents who have an "elevated level of psychological distress' and who do not. |
| **Socio-demographic indicators** | |
| Living arrangements | This variable was derived from two variables: the type of residence ("University residence", "Other university housing" "Non-university housing") and with whom the respondent is living ("Alone", "With spouse/partner", "With parents", "With other family members", "With friends/acquaintances", and "Other").<br>An answer of "University residence" or "Other university housing" rendered category "On campus". An answer of "Non-University housing" or "Other" and "Alone" rendered category "Off campus (alone)". An answer of "Non-University housing" or "Other" and "With spouse/partner", "With parents" or "With other family members" rendered category "Off campus (with family)". And an answer of "Non-University housing" or "Other" and "With friends/acquaintances" or "Other" rendered category "Off campus (with friends/other)". |

## *REFERENCES AND BIBLIOGRAPHY*


1. Biemer, P.P. and L.E. Lyberg, *Introduction to Survey Quality*. Survey Methodology, ed. W. Series. 2003, Hoboken, NJ: John Wiley & Sons, Inc.
2. Groves, R.M., et al., *Survey Methodology*. 2004, Hoboken, NJ: John Wiley and Sons.
3. Dillman, D.A., J.D. Smyth, and L.M. Christian, *Internet, mail, and mixed-mode surveys: the tailored design method*. 3 ed. 2008, Hoboken, NJ: Wiley & Sons.
4. Kaplowitz, M.D., T.D. Hadlock, and R. Levine, *A Comparison of Web and Mail Survey Response Rates.* Public Opin Q, 2004. **68**(1): p. 94-101.
5. Pealer, L.N., et al., *The Feasibility of a Web-Based Surveillance System to Collect Health Risk Behavior Data from College Students.* Health Educ Behav, 2001. **28**(5): p. 547-559.
6. Dillman, D.A., *Mail and Internet Surveys: The Tailor Design Method*. 2nd ed. 2000, New York: Wiley.
7. Freeman, C.M., *Living Envrionment, Social Context, Heavy Drinking and Cigarette Smoking Among University Students*. 2002.
8. Ferris, J. and H. Wynne, *The Canadian Problem Gambling Index: Final Report*. 2001, Canadian Centre on Substance Abuse: Ottawa.
9. *GENACIS Project - Gender, alcohol, and culture: an international study*. 2010 May 5 [cited 2010 August 15]; Available from: http://www.genacis.org/.
10. Adlaf M., E., A. Demers, and L. Gliksman, *Enquête sur les campus canadiens 2004*. 2005, GRASP - Université de Montréal. p. 141.
11. Babor, T.F., et al., *AUDIT The Alcohol Use Disorders Identification Test: Guidelines for use in Primary Health Care*, D.o.M.H.a. Substance, Editor. 1992: Geneva.
12. Goldberg, D.P., *Manual of the General Health Questionnaire*. 1978, London: Nelson Publishing Company.
13. Goldberg, D.P., T. Oldehinkel, and J. Ormel, *Why GHQ threshold varies from one place to another.* Psychological Medicine, 1998. **28**(04): p. 915-921.
14. McLellan, A.T., et al., *The Fifth Edition of the Addiction Severity Index.* Journal of Substance Abuse Treatment, 1992. **9**(3): p. 199-213.
15. Vitaro, F., et al., *Gambling, Substance Use, and Impulsivity During Adolescence.* Psychology of Addictive Behaviors, 1998. **12**(3): p. 185-194.
16. Groves, R.M. and M.P. Couper, *Nonresponse in Household Interview Survey*. 1998, New York: Wiley.
17. Canada, A.o.U.a.C.o. *Directory of Canadian Universities*. 2009 [cited 2009 June 11]; Available from: http://www.aucc.ca/can_uni/our_universities/index_e.html#Quebec.