COGNITIVE AND BEHAVIOURAL ASPECTS

Psychosocial Factors and Beliefs Related to Intention to Not Binge Drink Among Young Adults

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INTRODUCTION

Alcohol consumption gives rise to a host of social, physical and mental problems (e.g. Corrao et al., 2004; Babor et al., 2010). Alcohol is teratogenic, prenatal exposure may alter the development of the child (Chudley et al., 2005). In adolescents, alcohol consumption can affect the development of a young person’s brain while it is still undergoing major transformations (Crews et al., 2007). This can result in permanent or long-term damage in some brain structures or functions (Leschner, 2003; Briones et al., 2006). Recent studies have demonstrated anomalies in neuronal maturation of the brain among young consumers (Leschner, 2003; Brown et al., 2008; Squeglia et al., 2009).

Alcohol can impair judgment and psychomotor skills, and affect emotions and social responsiveness (Babor et al., 2003). Acute intoxication or alcohol abuse can lead to injuries and death, suicide, violence, work and school difficulties, risky sexual behaviors and other health and social problems (Léonard and Ben Amar, 2002; Babor et al., 2010). Of all the psychoactive substances, alcohol is the substance most commonly associated with crime and most frequently linked with violent crime. Indeed, a significant number of young consumers commit violent behavior under the influence of alcohol (Kodjo et al., 2004). Excessive alcohol consumption can be accompanied by a higher risk of abuse and dependence (Crews et al., 2007).

Binge drinking is usually defined as consuming more than four drinks (for men) or more than three drinks (for women), in about 2 h (National Institute of Alcohol Abuse and Alcoholism, 2004). Canadian guidelines define an alcoholic drink as a bottle of beer (12 ounces or 336 g), a glass of wine (5 ounces or 140 g) or a measure of spirits (1.5 ounces or 42 g) (Butt et al., 2011). Binge drinking is most frequent in young adults. In a 2009 Canadian population survey, 24.8% of male individuals and 10.1% of female individuals aged 12 years or older reported binge drinking (defined as having consumed more than four drinks per occasion at least once a month in the past year) (Statistics Canada, 2011). This pattern of drinking was reported by 45.6% of men and 26.4% of women aged 18–24 years, which is higher than in any other age group (Statistics Canada, 2010).

According to a Canadian population survey on addiction, 16% of participants aged 15 years and older reported having usually consumed more than four alcoholic drinks on the days when they used alcohol in the last year (Adlaf et al., 2005a). This proportion is significantly higher for respondents between 15 and 24 years old (33.7%); in this group it was higher for those aged 18–19 years (42.5%) (Flight, 2007). Among university students, 16.1% declared having regularly engaged in binge drinking at least once a week in the last year (Adlaf et al., 2005b).

Feeling pressure to start drinking and believing that many friends and siblings use alcohol are important determinants of the intention of young people to start using alcohol (Olds et al., 2005). Also, it seems that the perceived approval or disapproval of parents, teachers, the church members, peers, other college students and adults in the community has negligible impact on the intention of young people to start using alcohol (Olds et al., 2005). Moreover, an Australian study has established a relationship between the moral norm and lower alcohol use (Amonini and Donovan, 2006). These authors demonstrated that young people who consider alcohol use as ‘wrong under any circumstances’ are less likely to be drinkers than those who consider use ‘ok under some or any circumstances’.

Some authors have shown that binge drinking frequency in young adults aged 18–27 years is mainly related to perceived behavioral control (Norman et al., 1998). According to this study, binge drinkers are most influenced by a number of factors that encourage them to drink in this way (e.g. to celebrate an event) compared with youth who do not binge regularly. They are also less likely to believe that they

Abstract — Aims: The objective of the study was to identify psychosocial factors and salient beliefs associated with the intention of young people to not binge drink in the next month, applying an extended version of the theory of planned behavior. Methods: Among 200 youths randomly recruited from adult education centers in the province of Quebec, Canada, 150 completed a questionnaire. Of these, 141 youths reported having used alcohol in the last year—analyses were performed on this sub-sample. Results: The prediction model demonstrated that perceived behavioral control (odds ratio, OR = 2.60, 95% confidence interval, CI 1.59–4.23; P = 0.0001), attitude (OR = 2.49, 95% CI 1.14–5.43; P = 0.02) and moral norm (OR = 1.88, 95% CI 1.23–2.88; P = 0.004) are three determinant variables of intention to not binge drink in the next month. The intention is also related to cannabis use in the last month (OR = 0.17 95% CI 0.05–0.53; P = 0.002). Young people who believe that if they do not binge drink in the next month, they will have a lower risk of getting depressed (OR = 1.53, 95% CI 1.23–1.90; P = 0.0001), and those who believe they will be able to not binge drink even if they are at a party (OR = 1.58, 95% CI 1.29–1.94; P < 0.0001), are more likely to have a positive intention. Conclusion: Despite some methodological limitations, this study revealed several options for helping young people to not binge drink during their school career.

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The theory of planned behavior (TPB) has helped to explain various behaviors in the field of health (Godin and Kok, 1996; Armitage and Conner, 2001), as well as binge drinking (Norman et al., 1998; Cooke et al., 2007; French and Cooke, 2012). This theory was chosen as the basis for organizing our study’s theoretical framework. According to Ajzen (1985), the immediate determinant of behavior is the intention to adopt this behavior or not. In the TPB, three direct constructs influence intention: attitude, subjective norm and perceived behavioral control. First, attitude refers to a more or less favorable evaluation of the adoption of a behavior. Subjective norm corresponds to the subject’s perception of whether other important individuals or groups will approve of the behavior. Perceived behavioral control is defined as the perception of the degree of ease or difficulty of adopting a given behavior.

Each of the three main determinants of intention is supported by a belief structure. Behavioral beliefs (attitude) reflect the perceived advantages and disadvantages of the adoption of the behavior. Normative beliefs (subjective norm) refer to the perception of the degree of approval by specific groups or individuals regarding the adoption of a given behavior. Control beliefs (perceived behavioral control) point to barriers and conditions hindering or favoring the adoption of the behavior.

According to Ajzen (1991), behavior is a function of salient information, or beliefs, relevant to the behavior. These ‘salient’ beliefs are considered to be the prevailing determinants of a person’s intentions and actions. So, in order to achieve change in behavior or in intentions to perform a behavior, it is essential to identify these beliefs. Ultimately, in our context, interventions to prevent binge drinking should be aimed at developing intention by focusing on these beliefs.

To take into account other explicative variables identified in the literature, other theoretical variables were added to the model. Moral norm measures the feeling of personal obligation regarding the adoption of the behavior. This factor refers to rules of personal conduct, meaning that the person must evaluate the extent to which the behavior corresponds to his or her personal principles. Some authors have shown the usefulness of this variable in providing a better understanding of alcohol use (McMillan and Conner, 2003; Amonini and Donovan, 2006). Perceived descriptive norm and anticipated regret were also identified as potential determinant factors of the intention to adopt health-related behaviors including reduction of binge drinking (Sheeran and Orbell, 1999; Rivis and Sheeran, 2003; Cooke et al., 2007). Perceived descriptive norm refers to the perceived prevalence of the behavior in the reference population. Consequently, if people perceive that others are adopting the behavior, it is perceived as the right thing to do. Anticipated regret refers to the individual’s perception of the level of regret, tension or worry that he or she would feel if he or she did not adopt the behavior (Fishbein and Ajzen, 2010). Finally, so-called external variables are also part of the model. Fishbein and Ajzen (2010) have already recognized the potential importance of such background factors. In our case, these variables include sociodemographic and substance-use profiles (prevalence and frequency).

OBJECTIVES

This study uses an extended version of the TPB to identify psychosocial factors and salient beliefs associated with the intention of young people aged 18–24 years attending adult education centers to not binge drink in the next month.

METHOD

Design and population under study

A cross-sectional study was conducted to identify predictors of intention to not binge in the coming month. The target population consisted of young adults between 18 and 24 years old enrolled in a general academic program at an adult education center in the province of Quebec, Canada, who had used alcohol at least once within the last 12 months.

Collection procedure

In spring 2010, data collection took place in nine adult education centers in the province of Quebec, Canada. The required sample size to carry out analyses was calculated to

THEORETICAL FRAMEWORK

The design and population under study
ensure a statistical power of 80% at a threshold of $P < 0.05$. Thus, we needed a minimum of 105 participants. To reach this sample, we had to recruit a total of 200 youths to take into account an estimated 20% of non-drinkers as mentioned in the Canadian addiction survey (Flight, 2007) and 30% of possible refusals to participate. Participant selection was conducted using simple random sampling without replacement. For each education center, a list of all personal numbers of youths enrolled and aged between 18 and 24 years was submitted to the SURVEYSELECT procedure of SAS Software to get a random list of potential participants. Randomly selected students were then individually solicited by a school social worker. Those who agreed to participate subsequently met with a research staff member and signed a consent form. Then, they were given a questionnaire which they had to complete individually on site and deliver to the research staff member in a sealed envelope. The questionnaire was anonymous. This study was approved by the ethics committee of Laval University, Quebec, Canada.

**Measures**

The questionnaire was developed based on Ajzen’s recommendations (Ajzen, 2010). Thus, information relevant to developing questions regarding behavioral, normative and control beliefs was first collected through a qualitative approach during focus groups conducted among 45 young people recruited in two education centers that participated in the study.

The questionnaire was divided into two sections. The purpose of the first section was to measure each theoretical variable comprising TPB direct variables (intention, attitude, subjective norm and perceived behavioral control), the underlying beliefs of these variables identify during focus groups (control belief, behavioral belief and normative belief) and other theoretical variables (moral norm, descriptive norm, anticipated regret). The second section of the questionnaire was designed to measure external variables (sociodemographic, sociocultural and patterns of substance use).

At the beginning of the questionnaire, binge drinking was defined as drinking more than three drinks for girls or more than four drinks for boys in a single occasion. Participants were then shown some common alcoholic drinks with information on equivalence. The definition of binge drinking were then shown some common alcoholic drinks with information. The purpose of the first section was to measure each theoretical variable comprising TPB direct variables (intention, attitude, subjective norm and perceived behavioral control), the underlying beliefs of these variables identify during focus groups (control belief, behavioral belief and normative belief) and other theoretical variables (moral norm, descriptive norm, anticipated regret). The second section of the questionnaire was designed to measure external variables (sociodemographic, sociocultural and patterns of substance use).

The intention to not binge drink in the next month was measured using three items: (1) ‘I intend to not binge drink in the coming month’; (2) ‘In the coming month, the chances that I will not binge drink are …’? (3) ‘In the coming month, I will not binge drink’. A scale ranging from strongly disagree (+1) to strongly agree (+7) was used for the first item, a scale from very low (+1) to very high (+7) was used for the second item and a scale from very unlikely (+1) to very likely (+7) was used for the third item ($\alpha = 0.87$).

Attitude was measured using five semantic differentiators on a seven-point scale. ‘For me, to not binge drink in the coming month would be: … (1) very unpleasant (+1)/very pleasant (+7); (2) very bad (+1)/very good (+7); (3) very unsafe (+1)/very safe (+7); (4) very unsatisfactory (+1)/very satisfactory (+7); (5) very undesirable (+1)/very desirable (+7) ($\alpha = 0.86$). Behavioral beliefs consisted of 14 items. These items were the following: ‘In the coming month, if I do not binge drink, I think that (1) It will be better for my health; (2) I will save money; (3) I will have a lower risk of being sick (vomiting) during the evening; (4) I will have a lower risk of developing liver problems; (5) I will have a lower risk of alcohol dependence; (6) I will consume fewer calories; (7) I will have better control of myself; (8) I will have a lower risk of saying or doing something I may regret; (9) My evenings will be more enjoyable; (10) I will have a lower risk of getting depressed; (11) I will have a lower risk of becoming aggressive or violent; (12) I will have a lower risk of having an accident; (13) I will have a lower risk of hurting others; (14) I will have a lower risk of losing my job’. A scale ranging from strongly disagree (+1) to strongly agree (+7) was used.

The subjective norm consisted of three items: (1) Most of the people who are important to me would recommend that I do not engage in binge drinking in the coming month; (2) The people most important to me think I should not binge drink in the coming month; (3) If I do not binge drink in the coming month, most of the people who are important to me will …’. The same measurement scale ranging from strongly disagree (+1) to strongly agree (+7) was used ($\alpha = 0.73$). The normative beliefs consisted of four items: ‘The following people would approve of the fact that I will not binge drink in the coming month: (1) My close friends; (2) My grandparents; (3) My parents (father or mother); (4) My girlfriend/boyfriend,’ with the same scale ranging from strongly disagree (+1) to strongly agree (+7).

Three items formed the construct of perceived behavioral control. The first item was ‘(1) For me, to not binge drink in the coming month would be …’ with choices ranging from very difficult (+1) to very easy (+7). The two other items were ‘(2) In the coming month, I will be able to not binge drink; (3) In the coming month, if I decide to not binge drink, I am confident that I will succeed,’ with choices ranging from strongly disagree (+1) to strongly agree (+7) ($\alpha = 0.81$). Control beliefs referred to five facilitating factors and six possible obstacles. The facilitating factors were as follows ‘It would be easier for me to not binge drink in the coming month if …: (1) I set myself budget limits; (2) I had to go to work/school the next day; (3) I had to drive a car; (4) I knew my personal drinking limits; (5) People around me do not binge drink.’ The six obstacles to overcome were the following: ‘In the coming month, I will be able to not binge drink even if …: (1) I am at a party; (2) I watch a hockey game; (3) alcohol is not expensive (open bar); (4) my parents drink; (5) I experience difficulties; (6) my friends urge me to drink.’ The same scale from strongly disagree (+1) to strongly agree (+7) was used for each of these beliefs.
The moral norm was constructed using three items: ‘(1) My personal values lead me to not binge drink in the coming month; (2) For me, to not binge drink in the coming month is a matter of principle; (3) I consider that to not binge drink in the coming month is a matter of personal responsibility for me.’ The same scale from strongly disagree (+1) to strongly agree (+7) was used ($\alpha = 0.77$). Also, with the same answer choices, anticipated regret included three items: ‘If I binge drink in the coming month … (1) I will feel concerned afterwards; (2) I will have regrets afterwards; (3) I will be worried afterwards’ ($\alpha = 0.80$).

Finally, the descriptive norm was measured using the following question: ‘In your opinion, what percentage of people around you does not binge drink?’ A scale ranging from 0 to 100% in increments of 10% was given.

Sociodemographic and sociocultural variables included gender, age, birthplace and languages spoken at home. In terms of substance use, participants were asked to indicate whether they had ever taken, at least once in their life and at least once within the last 12 months, the following other substances: cannabis, cocaine, heroin, magic mushrooms, amphetamines, methamphetamine, ecstasy, gamma hydroxybutyric acid (GHB), solvent or others. They were asked to indicate the frequency of alcohol, cannabis or other drug use in the last month according to the following choices: everyday, three to four times a week, once or twice a week, three to four times a month, one to two times a month or never. The frequency of binge drinking was asked with the same answer choices provided: ‘In the last month how many times did you have more than three drinks on the same occasion (if you’re a girl) or more than four drinks (if you’re a boy)?’

Finally, the last question was ‘Generally speaking, did you answer all the questions honestly?’ This question and preliminary analysis of possible inconsistencies in the responses regarding prevalence of use (e.g. reporting no use in the last month but use in the last week) were used to take into account possible memory and social desirability bias. All respondents specified that they answered all questions honestly and no inconsistencies were noted regarding the prevalence of use.

**Analysis plan**

Respondents’ sociodemographic, behavioral and psychosocial profiles were first established using descriptive statistics. Univariate analyses were then carried out between external variables and intention, as well as between psychosocial variables. As a result of the distribution of the intention variable and the fact that we wished to differentiate people with positive intention to not binge drink (≥4 on a scale of 7) from those without positive intention to not binge drink (≤4 on a scale of 7), the intention variable was dichotomized. Thus, logistic regression can be applied. This dichotomy also corresponded to the median of the sample. The Wilcoxon test was then used to determine whether there was a significant difference for each belief depending on whether the intention was positive or not. Logistic regression was then applied to identify the explanatory model of behavioral intention. Direct theoretical variables were entered into the model, as were external variables shown to have a strong relation with intention at a threshold of $P < 0.05$ in univariate logistic regression. Subsequently, a logistic regression analysis of beliefs significantly associated with intention was carried out in order to identify the most strongly related beliefs. Regression models of the prediction of intention were submitted to the Hosmer and Lemeshow test (Hosmer and Lemeshow, 2000), and the area under the receiver operating characteristics curve was evaluated to ensure their goodness of fit and discrimination power. Choices underlying these analyses were based on the recommendations of Von Haeften et al. (2001). All analyses were conducted using SAS software (SAS Institute Inc., 2008).

**RESULTS**

Among the 200 youths recruited, 150 (75%) completed the questionnaire, of whom 141 reported having used alcohol in the last year. The following tests were performed on this subsample of drinkers, consisting of a slight majority of women (57.5%). The average age was $20.1 \pm 1.87$ years and 79.3% were born in the province of Quebec and spoke only French or English at home.

Among those who had used alcohol in the last year, 51.1% have binged at least once in the last month and 20.6% have binged at least one time per week in the last month; 45.0% have also used cannabis, and 14.9% have used another drug at least once in the last month. Other drugs used in the past year by young alcohol users were amphetamines (21.6%), ecstasy (10.9%), magic mushrooms (10.7%), cocaine (7.9%), GHB (2.9%) and methamphetamine (1.4%).

No statistically significant difference was observed between binge drinking at least once in the last month and sociodemographic variables. On average, young alcohol users have a slightly positive intention to not binge drink in the coming month ($4.8 \pm 1.8$) and more than two-thirds of them (67.4%) have a positive intention to adopt this behavior (i.e. ≥4 on a scale of 7). A significant gender difference was observed: with a smaller percentage of boys than girls had a positive intention to not binge drink ($58.3 \text{ vs. } 74.1\%$, $\chi^2 = 3.89, P = 0.05$). In addition, a higher percentage of young people born outside Quebec or who speak a language other than French or English had a positive intention compared with youth born in Quebec and who spoke only French or English at home ($83.7 \text{ vs. } 63.1\%$, $\chi^2 = 4.04, P = 0.04$).

Furthermore, fewer respondents who had binged in the last month had a positive intention to not binge drink in the coming month compared with those who had not (61.4 vs. 83.5%, $\chi^2 = 5.81, P = 0.02$). The same goes for those who had used cannabis in the last month (46.0 vs. 84.4%, $\chi^2 = 23.14, P < 0.0001$) and those who had used other drugs in the last month (47.6 vs. 70.8%, $\chi^2 = 4.38, P = 0.04$).

Means, standard deviation and intercorrelations between psychosocial variables are presented in Table 1. As the model indicates, except for the descriptive norm, all theoretical variables were significantly correlated with intention.

**Prediction of the intention to not binge drink**

The theoretical variables (attitude, anticipated regret, subjective norm, perceived behavioral control and moral norm) and external variables significantly associated with intention to not binge drink at a threshold of $P < 0.05$ in univariate logistic regression (gender, cultural origin, binge drinking in the
Concerning control beliefs, all barriers measured differentiate respondents according to their level of intention. Thus, people with a positive intention believe more strongly than others that they would be able to not binge drink in the coming month even if they are at a party, they watch a hockey game, alcohol is not expensive (open bar), their parents drink, they experience difficulties and their friends urge them to drink. Also, people with a positive intention believe more strongly than others that it would be easier to not binge drink in the next month if they set budget limits for themselves. The following beliefs do not differentiate respondents according to their level of intention: belief that it would be easier to not binge drink if they had to go to work/school the next day, they had to drive a car, they knew their personal drinking limits and if the people around them do not binge drink (see Fig. 2).

Finally, people with a positive intention believe more strongly than others that their close friends (5.0 vs. 4.1; \( P < 0.05 \)) and their girlfriend/boyfriend (5.0 vs. 4.3; \( P < 0.05 \)) would approve if they did not engage in binge drinking in the coming month. The perceived approval of the father (4.9 vs. 4.7; \( P = 0.83 \)) or the mother (5.3 vs. 4.8; \( P = 0.24 \)) does not seem related to the level of intention.

**Determinant beliefs of the intention to not binge drink**

Regression analysis of the beliefs underlying perceived behavioral control and attitude made it possible to specifically identify two determinant beliefs of intention to not binge drink in the coming month. First, young people who believe that if they do not binge drink in the next month, they will have a lower risk of getting depressed, and secondly, those who believe they will be able to not binge drink even if they are at a party are more likely to have a positive intention to not binge drink in the next month (see Table 3).

**DISCUSSION**

The proportion of respondents in our sample who report having consumed alcohol in the last year and in the last month is similar to that of Quebec university students (90.7 vs. 89.7% in the last year and 80 vs. 83.3% in the last month) (Adlaf et al., 2005b). The proportion of young people who reported binge drinking in the last month (for those who have consumed alcohol in the last year) is high in our sample (51.1%) and there are no significant differences according to gender. Among young Canadians aged 15–24 years, the proportion of young men who reported usually consuming more than four drinks per occasion in the last year was much higher than proportion of young women (42.5 vs. 28.8%) (Flight, 2007). It is important to note that compared with

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### Table 1. Means, standard deviations and intercorrelations between psychosocial variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>1.00</td>
<td>0.67*</td>
<td>0.48*</td>
<td>0.64*</td>
<td>0.51*</td>
<td>0.60*</td>
<td>0.15</td>
<td>4.8</td>
<td>±1.8</td>
</tr>
<tr>
<td>Attitude</td>
<td>1.00</td>
<td>1.00</td>
<td>0.53*</td>
<td>0.58*</td>
<td>0.45*</td>
<td>0.61*</td>
<td>0.18**</td>
<td>5.0</td>
<td>±1.3</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>1.00</td>
<td>1.00</td>
<td>0.25***</td>
<td>0.27***</td>
<td>0.34*</td>
<td>0.23***</td>
<td>5.6</td>
<td>±1.5</td>
<td></td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td>1.00</td>
<td>1.00</td>
<td>0.27***</td>
<td>0.34*</td>
<td>0.23***</td>
<td>5.6</td>
<td>±1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipated regret</td>
<td>1.00</td>
<td>1.00</td>
<td>0.61*</td>
<td>0.16</td>
<td>3.7</td>
<td>±1.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moral norm</td>
<td>1.00</td>
<td>1.00</td>
<td>0.61*</td>
<td>0.16</td>
<td>3.7</td>
<td>±1.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cannabis use within 30 days</td>
<td>1.00</td>
<td>1.00</td>
<td>0.61*</td>
<td>0.16</td>
<td>3.7</td>
<td>±1.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Area under receiver operating characteristics curve: 0.93; Hosmer and Lemeshow test: \( P = 0.96 \).

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### Table 2. Predictors of intention to not binge drink in the coming month

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived behavioral control</td>
<td>2.60</td>
<td>1.59–4.23</td>
<td>0.0001</td>
</tr>
<tr>
<td>Attitude</td>
<td>2.49</td>
<td>1.14–5.43</td>
<td>0.02</td>
</tr>
<tr>
<td>Moral norm</td>
<td>1.88</td>
<td>1.23–2.88</td>
<td>0.004</td>
</tr>
<tr>
<td>Cannabis use within 30 days</td>
<td>0.17</td>
<td>0.05–0.53</td>
<td>0.002</td>
</tr>
</tbody>
</table>

\( *P<0.0001; **P<0.05; ***P<0.01 \).
most studies which make no distinction between men and women in their measurement of binge drinking, in our study, we use the definition of the NIAAA which states that binge drinking refers to the consumption of more than four drinks for men and more than three drinks for women. This could explain the fact that there was no significant difference according to gender in our sample. Finally, about one drinker in five (20.6%) reported having engaged in binge drinking at least once a week in the last month.

In our study, a little more than two-third of respondents reported a positive intention to not binge drink in the next month. This study indicated that both perceived behavioral control and attitude predict intention to not binge drink. These results corroborate those of other authors who demonstrated the importance of control and attitudinal variables in the explanation of the frequency of binge drinking and the intention to limit the amount of alcohol (Norman et al., 1998; Cooke et al., 2007). In our study, the intention to not
If I will not binge drink, I will have a sense of responsibility (moral norm)—this corroborates the results of Amonini and Donovan (2006). The fact that our sample consisted of young adults, rather than adolescents, who are returning to school and have probably more responsibility than younger students may explain this result. Some of them no longer live with their parents, whereas others are already parents themselves, situations that require the development of a sense of responsibility.

Young adults who use cannabis in the last month are less likely to have a positive intention to not binge drink. This points to the importance of raising the matter of other substance use, particularly cannabis, when dealing with reducing binge drinking among young adults.

In our study, anticipated regret, subjective norm and descriptive norm were not significantly associated with the intention to not binge in the next month. Concerning anticipated regret, Cooke et al. (2007) states that this variable was associated with a positive intention to limit alcohol consumption in the next week. In our study, the temporal context of the behavior on a period of 1 month rather than a week might explain this difference. Concerning subjective and descriptive norms, the strength of intention does not appear to be related to young people’s perceived approval of important people, but rather to their perceptions of the prevalence of binge drinking by key people in their environment. These results are consistent with those of Cooke et al. (2007), who also did not observe any association between these two variables and intention to limit alcohol consumption. It is not surprising to note that subjective norm is less important considering that we are dealing with young adults who are possibly less influenced by others than younger people. For the descriptive norm, the lack of association in our study can be explained by the fact that the perception of prevalence is so close to the real prevalence.

Finally, some authors have identified a number of beliefs associated with binge drinking (Norman et al., 1998; Murgraff et al., 2001; French and Cooke, 2012). In our case, analyses allowed us to unveil beliefs associated with intention to not binge drink. These findings are important for developing preventive interventions aimed at curbing binge drinking among young adults who go back to school in the province of Quebec.

### Limits and strength

Certain limitations concerning any generalization of these results must be addressed. First, participating education centers were not randomly chosen which might constitute a possible selection bias. The young people recruited are possibly not representative of all people at adult education centers in Quebec. For example, participating education centers were all located in urban communities and differences might have been observed in rural areas. However, preliminary analysis indicated that there were no significant differences by gender, age or cultural origin, and by alcohol, cannabis and other drugs use among the participating education centers. Youths from different education centers were therefore comparable. Also, we would point out that young people were randomly selected in education centers, a strength of this study.

The use of a self-administered questionnaire and a self-reported behavioral measure of alcohol and other drugs use can lead to memory bias or social desirability bias. However, preliminary analysis of possible inconsistencies in the responses regarding prevalence of use (e.g. reporting no use in the last month but use in the last week), as well as affirmation of all respondents that they answered all questions honestly, leads us to believe that the reported behavior is to some degree reliable. Also, it should be pointed out that the questionnaire had previously been tested to check the internal consistency of measured theoretical variables and temporal stability. This constitutes strength of the study, as does the use of a theoretical model that is well established in the field of understanding health-related behaviors. This study has allowed a better understanding of the intention of young adults to not binge drink, which results in a number of options for helping them to limit their alcohol consumption.

### Implications and paths of action

In light of the results of this study, an intervention aimed at helping young adults to not binge drink should first focus on specific control beliefs that differentiate young people with a positive intention from those without one. It will be useful for them to identify and use strategies to resist binge drinking even if they are at a party, they watch a hockey game, alcohol is not expensive, their friends urge them to drink, their parents drink or they experience difficulties. Finally, suggesting to young people to plan a budget for their evening may help them to not binge drink.

To help young people to not binge drink, it would also be appropriate to suggest that if they do not binge drink, it will be better for their health, their evenings will be more enjoyable, they will have a lower risk of being sick (vomiting) during the evening, they will have better control of themselves, they will also have a lower risk of saying or doing something they may regret, hurting others, having an accident, losing their job, becoming aggressive or violent and becoming alcohol dependent. It must be argued that to not binge drink can help them to avoid getting depressed, because alcohol is a central nervous system depressant.

Finally, moral norm regarding binge drinking is another important variable that should be acted on. It might be useful to encourage young people to recognize that their behavior concerning alcohol consumption should be related to a sense of responsibility or a question of principle.

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### Conflict of interest statement

The authors report no conflicts of interest.
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