# The importance of expectations in the relationship between impulsivity and binge drinking among university students

## *Importancia de las expectativas en la relación entre impulsividad y consumo intensivo de alcohol en universitarios*

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## Resumen

El consumo intensivo de alcohol (CIA) en universitarios tiene importantes implicaciones clínicas y sociales que motivan la necesidad de indagar sobre los factores que favorecen su aparición y consolidación. Concretamente, este estudio evalúa el papel de la impulsividad y las expectativas asociadas al consumo, así como la posible mediación de las expectativas en la relación entre impulsividad y CIA.

303 estudiantes de primer curso de la Universidad Complutense de Madrid que realizan CIA cumplimentaron un autoregistro de consumo, una escala de expectativas asociadas a esta ingesta (IECI, 2012) y la escala BIS-11 de impulsividad. En todos los casos, tanto varones como mujeres, duplican los gramos de alcohol que definen un CIA, así como la frecuencia de realización de esta conducta a partir de la cual se incrementa la probabilidad de aparición de consecuencias negativas.

No se encuentran diferencias entre varones y mujeres en las expectativas asociadas al CIA, ni en la impulsividad total. Los análisis de regresión de orden jerárquico muestran que las expectativas no moderan la relación entre impulsividad y consumo. Las dos variables influyen de manera independiente en el consumo (gramos de alcohol ingeridos y frecuencia de realización de la ingesta), siendo mayor el peso de las expectativas en ambos sexos, pero resultando significativo el aporte de la impulsividad sólo entre los varones. Esto justifica la necesidad de planificar intervenciones que contemplen la modificación de estas expectativas, incluyendo en el caso de los varones aspectos relacionados con la impulsividad.

*Palabras Clave:* consumo intensivo de alcohol, universitarios, género, impulsividad, expectativas.

## Abstract

Alcohol intensive consumption (AIC) in university students has important clinical and social implications that motivate the need to look into the factors that favor its apparition and consolidation. More concretely, this study assesses the role of impulsivity and the associated expectations about consumption, as well as the possible mediation of expectations in the relationship between impulsivity and AIC.

Three hundred and three students in the first year at the University Complutense of Madrid that carry out AIC kept a self-record of their consumption, a scale of expectations associated to the ingestion (IECI, 2012), and the BIS-11 scale of impulsiveness. In all cases, both men and women, doubles the grams of alcohol that define an AIC, as well as the frequency in the execution of this behaviour, which increases the probability that these negative consequences come about.

No differences were found between men's and women's expectations associated to AIC, nor in their total impulsivity scores. The hierarchy regression analysis shows that expectations do not moderate the relationship between impulsivity and consumption. Both variables influence the independent mode of consumption (grams of ingested alcohol and frequency of ingestion), with a higher weight on expectations from both, men and women, but being significant the input of impulsivity only among males. This justifies the need to plan interventions that address the modification of these expectations, including, in the case of males, the aspects related to impulsivity.

*Key Words:* binge drinking, university students, gender, impulsivity, alcohol expectations.

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The consumption of high quantities of alcohol during a reduced time interval (AIC) is frequent among university students (Cadaveira, 2010; Cortés, Espejo, & Giménez, 2007; 2008; Jennison, 2004; Wechsler et al., 2002). According to the latest Spanish surveys (OED, 2011), more than 66% of adolescents that have consumed alcohol during the previous month acknowledge to have taken 5 or more drinks in a 2 hours' interval (70.7% males and 62.2% females). This practice represents a very serious problem of public health (Marczinski, Grant, & Grant, 2009; SAMHSA, 2009) because of the important clinical and social implications with which it is associated (Balodis, Potenza, & Olmstead, 2009; Cortés et al., 2012; Jennison, 2004).

Youngsters who consume in this fashion have a greater propensity to: academic problems, undertaking risky sexual relations, getting lesions, driving under the effects of alcohol and manifesting psychiatric disorders (Jennison, 2004; Vik, Carrello, Tate, & Field, 2000; Wechsler, Dowdall, Davenport, & Castillo, 1995; Wechsler, Lee, Kuo, & Lee, 2000; Wechsler et al., 2002). Besides, after graduation, these people usually take less relevant jobs and get lower incomes (Robin, Long, Rasmussen, Albaugh, & Goldman, 1998). The relevance of these consequences demands an analysis of the factors associated to this type of consumption, allowing the identification of youngsters in a situation of risk and the planning of an intervention adequate to their needs.

Although this is a type of consumption that has existed for over a decade, it has only recently generated greater research (Courtney & Polich, 2009; Sher, Grekin, & Williams, 2005).

One of the assessed areas is that of personality traits (Dawe, Gullo, & Loxton, 2004; Moeller & Dougherty, 2002; Sher et al., 2005) and, more concretely, that of impulsivity (Adan, 2012; Balodis et al., 2009; Carlson & Johnson, 2012; Henges & Marczinski, 2012) defined as a multidimensional construct (Cyders, Flory, Rainer, & Smith, 2010; Henges et al., 2012; Meda et al., 2009; Patton, Stanford, & Barrat, 1995; Quilty & Oakman, 2004; Stanford et al., 2009; Whiteside & Lynam, 2001) which makes possible different aspects and contributes in different degrees to alcohol consumption (Castellanos-Ryan, Rubia, & Conrod, 2011; Curcio & George, 2011; MacKillop, Mattson, Anderson, Castelda, & Donovick, 2007).

Research has proven that there is a relationship between impulsivity and an earlier start in the consumption of alcohol (Dom, D'haene, Hulstijn, & Sabbe, 2006; Fox, Bergquist, Gu, & Sinha, 2010; Iacono, Malone, & McGue, 2008; Tarter et al., 2003), the repetition of consumptions (Aragues, Jurado, Quinto, & Rubio, 2011; Colder & Chassin, 1997; Dick et al., 2010; Nees et al., 2012; Potenza & de Wit, 2010; Quinn, Stappenbeck, & Fromme, 2011; Shin, Hong, & Jeon, 2012), the ingestion of greater quantities of this substance (Benjamin & Wulfert, 2005; von Diemen, Bassani, Fuchs, Szobot, & Pechansky, 2008), the intensive ingestion of alcohol (Adan, 2012; Field, Schoenmakers, & Wiers, 2008; Goudriaan, Grekin, & Sher, 2007, 2011; MacKillop et al., 2007; Prado, Crespo, Brenlla, & Páramo, 2007; White et al., 2011) and the progression towards the addiction (Pedrero, 2009; Perry & Carrol, 2008; Tarter et al., 2003; Verdejo, Lawrence, & Clark, 2008).

The existence of a greater impulsivity among males has been predicted, both, in normal population, as well as in clinical samples (Adan, 2012; Adan, Natale, Caci, & Prat, 2010; Balodis et al., 2009; Caci, Nadalet, Baylé, Robert, & Boyer, 2003; Claes, Vertommen, & Braspenning, 2000; Field et al., 2008; Perry et al., 2008; Waldeck & Miller, 1997; Zuckermann & Kuhlman, 2000), although in some cases contradicting results have been found (Reynolds, Richards, & de Wit, 2006).

Recently, Carlson et al. (2012) warned us that this personality trait does not affect behaviour in isolation because expectations play an important moderating role, even when this relationship has been widely questioned by other researchers (Kuntsche, Von Fischer, & Gmel, 2008; Martin, 2011; Read, Wood, Kahler, Maddock, & Palfai, 2003).

A good alcohol consumption predictor in adolescence is found in the expectations over its effects (Cooper, Russell, Skinner, & Windle, 1992; Fischer, Smith, Anderson, & Flory, 2003; Martin, 2011). More concretely, having positive expectations leads to an increase of the ingestion and of the number of related problems (Ouellette, Gerrard, Gibbons, & Reis, 1999; Smith, 1994), whereas having negative expectations is linked to a lesser consumption (Jones, Corbin, & Fromme, 2001).

Throughout time, gender differences have become more evident in alcohol consumption, as well as in the expected effects of this behaviour (Balodis et al., 2009). With respect to the consumption, the percentage of males with intense alcohol consumption, who have also reported a high and frequent ingestion, is greater than it is in women (Gliksman, Adlaf, Demers, & Newton, 2003; O'Malley & Johnston, 2002; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994; Wechsler et al., 1995). As for the expectations related to consumption, men have shown to be more prone to drinking as a part of their coping and stress reduction strategies (Balodis et al., 2009; Harrell & Karim, 2008; Nolen-Hoeksema, 2004), reporting of greater expectations related to social recognition and to the improvement of sexual relations (Brown, Goldman, Inn, & Anderson, 1980; Ham & Hope, 2003; Mooney, Fromme, Kivlahan, & Marlatt, 1987). On the other hand, women believe they can improve their sociability and sexual capacity. However, it is important to remember that consumption among women is becoming more similar to that of men (Gliksman et al., 2003; Keyes, Grant, & Hasin, 2008; Nolen-Hoeksema, 2004. Wechsler et al., 1994, 1995), which is probably associated to a change of favorable expectations over the effects of alcohol (Young, Morales, McCabe,

Boyd, & Darcy, 2005). In all cases it has been proven that both, the intensity of consumption, as well as the associated expectations are related to impulsivity, even though there still is very little research on it (Carlson et al., 2012; Cooper, 1994; Henges et al., 2012; Kuntsche, et al., 2008; Martin, 2011; Read, et al., 2003) that have assessed the role of positive expectations towards consumption moderating the relationship between consumption and impulsivity, and they have shown contradicting results.

In these studies, it is evident that impulsivity and positive expectations are associated independently to alcohol consumption. Only two works, carried out with the Barrat –BIS-11- Impulsiveness Scale (Stanford et al., 2009), qualify the importance of expectations in the relationship between impulsivity and consumption. On the one hand, Carlson et al. (2012) do not find a significant relationship between impulsivity and alcohol consumption in those youngsters that have few positive expectations towards consumption. On the other hand, Henges et al. (2012) give evidence to the relationship between impulsivity and a concrete measure of the consumption pattern, such as the number of consumptions —5 or more drinks each time—, the number of days per month of binge drinking or the number of days when intoxication has been reached in those consumers with positive expectations.

In the current work, after verifying the results of prior research on consumption pattern differences, expectations and impulsivity among men and women, the aim is to test if expectations affect the relationship between impulsivity and alcohol intensive consumption (AIC), aiding clarification to the existing controversy over it. The AIC is measured based on quantity indicators in grams —60 g. in men and 40 g. in women— within a 2-3 hours' time interval (Hingson, Assailly, & Williams, 2004; MSC, 2008; NIAA, 2004) and frequency of this behavior of consumption in the previous six months (Courtney et al., 2009; Hartley, Elsabagh, & File, 2004; Townsheand & Duka, 2002, 2005; Weissenborn & Duka, 2003). It is hypothesized that, both, impulsivity and expectations are related to a high consumption —both, in quantity and in frequency—. On the other hand, given the existing controversy, the aim is to look into the possibility of impulsivity being significantly related to the consumption by people with positive expectations, especially among men.

## Method

### *Participants*

The sample was formed stratifying the students' population of the University Complutense of Madrid, choosing the grades of all knowledge areas (Basic sciences, Social sciences, Health sciences, Humanities and Educational sciences) with the largest number of students, including males and females. The battery of instruments was carried out during the 2011/2012 academic course, in the teaching classrooms and during the university hours (morning or afternoon), with members of the research team available in all cases. Out of the total number of students of the survey, 440 people were chosen who had no psychopathological background (positive SCL90R); substance abuse or substance dependence (including alcohol) (DSM-IV-TR criteria), nor a family history of alcoholism of first order. These students have taken part of a three-year longitudinal study that includes the assessment of a consumption pattern, their cognitive and personality determinants, as well as the functional and structural neuropsychological consequences resulting of this consumption. In this work, there is an assessment of the results from 303 students fulfilling the requirements to classify them as Alcohol Intensive Consumers (MSC, 2008). Women are 65.7% of the sample (n = 199). The mean age is 18.17 years (SD = .387).

### *Variables and Instruments*

**Impulsivity.** The BIS-11was used (Patton et al., 1995; Spanish adaptation of Oquendo et al., 2001), a self-report of 30 items with a Likert answer scale of 4 points. Stanford et al. (2009) reported that the total scores in this scale showed reasonable test-retest reliability (*rho de Spearman* = .83) and sufficient validity ($\alpha$ = .83).

**Expectations**. These were measured using the corresponding expectations section of the Instrument for the Assessment of Consequences derived from Alcohol Intensive Consumption, confected and validated in Spanish population (IECI; Cortés, Giménez, Tomás, Espejo, Pascual, Pedrero & Guardia, 2012). Participants reported via a 10 point Likert scale if they were "in agreement" (10) or "in disagreement" (0) with 16 different statements about the effects of carrying out an alcohol consumption. The sum of 16 scores constituted the "total sum of expectations" variable. This scale presents a good adjustment in all studies so far, including this work, with a Cronbach alfa oscilating between .900 and .913.

**Consumption Pattern.** This was recorded via the corresponding section included in the IECI (Cortés et al., 2012). This encompasses a self-report of the number of consumptions drunk, the type of alcohol consumed and the time interval in which the ingestion takes place, as well as the number of times it takes place within a 30 day period. Frequency is also measured for the previous six months.

The consumptions taken in a 2-3 hour interval have been transformed into grams of alcohol, using the reference of the Standard Drink's Unit in Spain: 10 grams of alcohol is the equivalent of one consumption of a fermented drink and of a half of a distilled drink (Rodríguez-Martos, Gual, & Llopis, 1999). From the estimation of grams of ingested alcohol, the type of consumption variable has been established, classifying youngsters in two categories: AIC and NO-AIC.

### *Data Analysis*

Although this work only included AIC students, the measures showed biased frequency distributions. To be coherent with data, Blom's transformation was applied (1958) to all continuous variables used in any analysis of this work. Cases are ordered by ranks, the rank for each case becomes a percentile and finally they get normalized. The result is a score "z" of ranks that reduces to the minimum the spurious impact of the extreme cases.

Blom's transformation has been used in previous studies of alcohol consumption in university populations (Sher, Wood, Wood, & Raskin, 1996), in uninhibited personality traits related to alcohol consumption (Krueger et al., 2002; Robbins & Bryan, 2004) and works about the relationship between impulsivity and alcohol consumption (Carlson, Johnson, & Jacobs, 2010; Carlson et al., 2012; Moshier, Even, & Otto, 2013).

In order to confirm what scales were strongly linked to the quantity of alcohol consumed and to identify variables that present unforeseen bivariated relations, correlations of zero order between the quantity of consumed grams and the potential predictors were tested. The variables that correlate with alcohol consumption with a $p< .10$ were included in the following analysis.

Some hierarchical multiple regression analysis were carried out (one for the sample and other two for both, men and women) to detect the only contributions to the impulsivity and expectations variables, as well as to test the hypothesis about the relationship between specific characteristics and the quantity of alcohol consumed.

In the analysis design, a similar structure to that one proposed by Carlson et al. (2012) was followed. Initially, age was included as a variable to be controlled during the first stage, given there are statistically significant differences, both, for consumed grams [$F(2,300)= 5.05$, $p=.004$], as in the score of total impulsivity [$F(2,300)= 10.073$, $p=.0001$], and in the total sum of expectations [$F(2,298)= 3.045$, $p=.049$]. After that, in order to get a better understanding of the effects of only impulsivity and expectations, two separate steps were introduced (steps two and three) the total score of the BIS-11 and that of the identified expectations in the analysis of correlations or zero order (a variable derived from the sum of them). Finally, in the step four, the interaction of both measures was introduced.

All the analysis was carried out with the SPSS 19 statistics pack.

## Results

The mean of consumed grams in a 2-3 hour session is 100.26 for the general sample. The consumption by men (120.29 g) is significantly higher ($p < .000$) than that of women (89.80 g).

There are also significant differences in the frequency of consumption during the previous six months. Men have a mean of 4.5 times AIC sessions, with 3.9 times in women ($p < .006$).

The aspects related to impulsivity for the whole sample, and separately, according to gender, are shown in Table 1. The only scale where there are significant differences is that of Non-planned Impulsivity, in which men present a score significantly higher than women (17.44 and 15.58, respectively; $p < .009$). In the rest, although the men's tendency is to score slightly higher than women, the differences are not significant.

If expectations of AIC with respect to their consumption (table 2) are considered, there are significant differences between men and women in one of the motives that score the least in general: it helps losing the notion of time ($p < .05$).

In the rest, if they are ordered in terms of their relevance for the whole sample of AIC's, it is appreciated that this is a normalized behavior ("It is habitual to do it on special occasions"), with which they look for an improvement in their emotional state ("It cheers you up, produces euphoria", "It makes you feel good", "It is fun" and "I like the feeling"), as well as a way to get uninhibited and to improve their interpersonal relationships ("It makes it easier to talk to others" and "It helps socializing").

Pearson's correlations between the total of consumed grams and the impulsivity and expectations scales are shown in Table 3, in general and, separately, by gender. All the scales of the BIS-11 correlate positively and significantly with the consumed grams, if the whole of the sample is assessed. In the case of men, the correlation of the total score of impulsivity and their cognitive and motor functions subscales. The latter is the only significant one for women.

With respect to the expectations, 12 scales correlate positively and significantly in the general sample. Only 3 of them ("It allows risks in sex", "It is a way to celebrate things" and "To lose the notion of time") resulted significant when considering only the women's subgroup.

For a further analysis, the four expectations that have not resulted significant for any group are discarded.

Table 1
*Scores of the 4 BIS-11 scales differentiated by gender*

| Scale | Mean | Sd | Male_Md | Male_sd | Female_Md | Female_sd | t | p |
|---|---|---|---|---|---|---|---|---|
| Cognitive Impulsivity | 14.00 | 4.277 | 14.34 | 3.746 | 13.83 | 4.529 | -.980 | .328 |
| Motor Impulsivity | 15.10 | 6.124 | 15.12 | 5.790 | 15.10 | 6.307 | -.027 | .979 |
| Non planned Impulsivity | 16.22 | 5.915 | 17.44 | 5.979 | 15.58 | 5.794 | -2.630 | .009 |
| TOTAL Impulsivity | 45.32 | 12.547 | 46.89 | 11.728 | 44.50 | 12.908 | -1.579 | .115 |

Table 2
*Expectations towards consumption ordered by their greatest representativeness among both collectives*

| Item | Mean | Sd | Male (Mn, sd) | | Female (Mn, sd) | | t | p |
|---|---|---|---|---|---|---|---|---|
| It is habitual to do it on special occasions | 5.99 | 2.579 | 6.07 | 2.291 | 5.95 | 2.722 | -.397 | .692 |
| It cheers you up, produces joy | 5.96 | 2.442 | 5.90 | 2.471 | 5.99 | 2.432 | .308 | .758 |
| It makes you feel good | 5.16 | 2.365 | 5.02 | 2.201 | 5.23 | 2.448 | .719 | .472 |
| It is fun | 5.15 | 2.527 | 5.31 | 2.434 | 5.07 | 2.577 | -.776 | .439 |
| I like the feeling it brings about | 5.13 | 2.417 | 5.29 | 2.228 | 5.05 | 2.512 | -.845 | .399 |
| To do or to say things I wouldn't | 5.76 | 2.589 | 5.81 | 2.386 | 5.74 | 2.695 | -.228 | .820 |
| Facilitates talking to others | 5.64 | 2.669 | 5.43 | 2.606 | 5.75 | 2.701 | .994 | .321 |
| It helps socializing | 5.04 | 2.693 | 5.03 | 2.533 | 5.05 | 2.779 | .066 | .948 |
| It helps me to stand the party longer | 4.48 | 3.202 | 4.66 | 3.176 | 4.38 | 3.219 | -.721 | .472 |
| It allows me to feel more confident | 3.99 | 2.807 | 3.87 | 2.618 | 4.05 | 2.905 | .503 | .616 |
| It is what most of my friends do when we go out | 3.72 | 3.070 | 4.10 | 3.039 | 3.53 | 3.076 | -1.534 | .126 |
| To get drunk | 3.32 | 2.719 | 3.61 | 2.729 | 3.17 | 2.708 | -1.324 | .187 |
| It is the way to celebrate things | 3.24 | 2.787 | 3.48 | 2.773 | 3.12 | 2.793 | -1.068 | .286 |
| It allows greater risks in sex | 2.91 | 2.866 | 3.26 | 2.859 | 2.73 | 2.860 | -1.535 | .126 |
| Losing the notion of time | 2.88 | 2.669 | 2.49 | 2.307 | 3.09 | 2.823 | 1.987 | .048 |
| It helps when I am nervous or depressed | 2.33 | 2.466 | 2.14 | 2.283 | 2.42 | 2.557 | .931 | .353 |
| Sum of the 16 expectations | 70.85 | 26.640 | 71.79 | 23.144 | 70.37 | 28.316 | -.467 | .641 |

Table 3
*Correlates of the total impulsivity and the expectations with the consumed grams*

| Measure | All | Male | Female |
|---|---|---|---|
| TOTAL Impulsivity | .200** | .325** | .111 |
| Losing the notion of time | .116* | .152 | .160* |
| Cheers you up, produces joy | .290** | .308** | .314** |
| It makes you feel good | .248** | .320** | .260** |
| To do or to do things I wouldn't normally | .225** | .284** | .215** |
| Facilitates talking to others | .093 | .085 | .044 |
| It allows you to feel more confident | .073 | .183 | .042 |
| It helps when I feel depressed or nervous | .083 | .156 | .079 |
| It allows more risks in sex | .183** | .121 | .182* |
| It helps me socialize | .114* | .133 | .121 |
| It is habitual to do it on special occasions | .130* | .191 | .109 |
| It is fun | .224** | .278** | .196** |
| It helps me stand longer a party | .243** | 353** | .176* |
| It is the way to celebrate things | .189** | .187 | .175* |
| I like the feeling | .314** | .431** | .264** |
| It is what most of my friends do when w ego out | .080 | .094 | .031 |
| To get drunk | .354** | .468** | .280** |

*.01 < $p \leq .05$ **.001 < $p \leq .01$

Tables 4, 5 and 6 show the results of a hierarchical multiple regression analysis to predict the consumed grams and the frequency of AIC episodes in the previous six months, both, for the global sample, and for men or women. In all cases, in the first step the age variable was controlled. This variable explains a significant quantity of the variance, both, of grams [$F(1,299) = 8.039$, $p = .005$], and of frequency [$F(1,299) = 6.233$, $p = .013$]. However, this significant contribution is not appreciated when testing their contribution in either men or women separately. In the case of women, age does not contribute to a significant variance in any of the analyzed variables. In the case of men, it only contributes in the prediction of consumed grams [$F(1,101) = 9.703$, $p = .002$].

The second step includes the total scores of the BIS-11. In the total sample, this variable contributes with 3.1% of the variance of consumed grams and 2.3% of the AIC frequency. In both cases, this contribution is significant.

When focusing on men or women, separately, the former's scores for total impulsivity contribute with a percentage of significant variance in the two variables analyzed, increasing almost 7% in grams, and almost 9% in frequency. Something very different occurs in the analysis carried out for women. In this, the increase of variance produced by the total impulsivity score is not significant in any of the predicted variables.

In the third step, the sum of the 12 expectations analyzed was introduced. This score also contributes with a quantity and significant variance in the two variables analyzed in the

total sample. More concretely, it implies an increase of 9% in the consumed grams and almost 5% in the frequency of consumption.

The contribution of this variable is significant only in the case of men when predicting the consumed grams (it increases 13.4% from the variance).

Among women, their contribution to the variance is significant in the two predicted variables: 9% in grams, and 6.7% in frequency.

In the last step, the total BIS interaction and the total score of expectations were introduced. This step did not turn out significant in any of the analysis performed.

Table 4
*Hierarchical multiple regression analysis to predict the consumed grams and the frequency of AIC episodes in the last 6 months*

| | | | | Step 1 | | Step 2 | | Step 3 | | Step 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable of consumption** | **Step in the regression model** | **△R²** | **F△R²** | β | ***p* value for β** | β | ***p* value for β** | β | ***p* value for β** | β | ***p* value for β** |
| Maximum consumed grams | Step 1: age | .026 | 8.039** | .162 | .005 | .131 | .022 | .101 | .064 | .102 | .064 |
| | Step 2: TOTAL BIS | .031 | 9.654*** | - | - | .177 | .002 | .117 | .036 | .117 | .035 |
| | Step 3: Reduced Experiences | .091 | 31.651*** | - | - | - | - | .310 | .000 | .310 | .000 |
| | Step 4: Total BIS Interaction x $Expectations_{12}$ | .000 | .032 | - | - | - | - | - | - | -.010 | .859 |
| Frequency 6m | Step 1: age | .020 | 6.233* | .143 | .013 | .116 | .045 | .095 | .095 | .097 | .086 |
| | Step 2: TOTAL BIS | .023 | 7.250*** | - | - | .155 | .007 | .111 | .054 | .114 | .048 |
| | Step 3: Reduced Experiences | .048 | 15.745*** | - | - | - | - | .226 | .000 | .228 | .000 |
| | Step 4: Total BIS Interaction x $Expectations_{12}$ | .003 | .985 | - | - | - | - | - | - | -.055 | .322 |

*.01 < $p \leq .05$ **.001 < $p \leq .01$ *** $p \leq .001$

Table 5
*Regression analysis of hierarchical order in males to predict the consumed grams and the frequency of AIC episodes in the last 6 months*

| | | | | Step 1 | | Step 2 | | Step 3 | | Step 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable of consumption** | **Step in the regression model** | **△R²** | **F△R²** | β | ***p* value for β** | β | ***p* value for β** | β | ***p* value for β** | β | ***p* value for β** |
| Maximum consumed grams | Step 1: age | .088 | 9.703** | .296 | .002 | .231 | .016 | .177 | .048 | .177 | .049 |
| | Step 2: TOTAL BIS | .068 | 8.083** | - | - | .269 | .005 | .169 | .064 | .173 | .061 |
| | Step 3: Reduced Experiences | .134 | 18.673*** | - | - | - | - | .387 | .000 | .393 | .000 |
| | Step 4: Total BIS Interaction x $Expectations_{12}$ | .001 | .128 | - | - | - | - | - | - | -.031 | .721 |
| Frequency 6m | Step 1: age | .009 | .936 | .096 | .336 | .021 | .827 | .000 | .999 | .000 | .998 |
| | Step 2: TOTAL BIS | .089 | 9.926** | - | - | .308 | .002 | .268 | .009 | .281 | .007 |
| | Step 3: Reduced Experiences | .021 | 2.386 | - | - | - | - | .154 | .126 | .173 | .090 |
| | Step 4: Total BIS Interaction x $Expectations_{12}$ | .010 | 1.130 | - | - | - | - | - | - | -.103 | .290 |

*.01 < $p \leq .05$ **.001 < $p \leq .01$ *** $p \leq .001$

Table 6
*Hierarchical multiple regression analysis in females to predict the consumed grams and the frequency of AIC episodes in the last 6 months*

| | | | | Step 1 | | Step 2 | | Step 3 | | Step 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variable of consumption** | **Step in the regression model** | **$\triangle R^2$** | **$F\triangle R^2$** | β | **p value for β** | β | **p value for β** | β | **p value for β** | β | **p value for β** |
| Maximum consumed grams | Step 1: age | .002 | .466 | -.049 | .496 | -.062 | .388 | -.082 | .230 | -.082 | .237 |
| | Step 2: TOTAL BIS | .014 | 2.735 | - | - | .118 | .100 | .066 | .344 | .066 | .343 |
| | Step 3: Reduced Experiences | .090 | 19.539*** | - | - | - | - | .306 | .000 | .306 | .000 |
| | Step 4: Total BIS Interaction x $Expectations_{12}$ | .000 | .045 | - | - | - | - | - | - | -.015 | .832 |
| Frequency 6m | Step 1: age | .020 | 3.978 | .141 | .047 | .133 | .063 | .115 | .096 | .118 | .089 |
| | Step 2: TOTAL BIS | .005 | 1.009 | - | - | .071 | .316 | .026 | .706 | .027 | .696 |
| | Step 3: Reduced Experiences | .067 | 14.271*** | - | - | - | - | .263 | .000 | .263 | .000 |
| | Step 4: Total BIS Interaction x $Expectations_{12}$ | .002 | .508 | - | - | - | - | - | - | -.049 | .477 |

*.01 < $p \leq .05$ **.001 < $p \leq .01$ *** $p \leq .001$

## Discussion

As in the case of previous research about AIC (Cadaveira, 2010; Cortés et al., 2007, 2008; Cortés, 2012) in both, men and women, the quantity of grams of consumed alcohol doubles (60g/40g) as does the frequency in the performance of that behavior (twice/month). When comparing both groups, there is a confirmation that men are above in both indicators (Gliksman et al., 2003; O'Malley et al., 2002; Wechsler et al., 1994; Wechsler et al., 1995).

The similarity in expectations related to consumption among men and women supports the homogenization that is observed between them for some years now. It may be helpful for any measure of intervention with intensive consumers to approach aspects related to the social normalization of consumption, the improvement of interpersonal abilities and of emotional coping. It is also important to point out the low correspondence between the euphoria and socializing effects that they expect to get and the grams of alcohol ingested.

It is confirmed that intensive alcohol consumers show a general high impulsivity (Adan, 2012; Field et al., 2008; Goudriaan et al., 2007, 2011; MacKillop et al., 2007; Prado et al., 2007; White et al., 2011), even though it may be added that among men, the lack of vision towards the future is more noticeable (Patton et al., 1995).

In general, impulsivity and most expectations are related to the quantity of alcohol ingested. It is important to underline that although impulsivity is related to consumption in the ICA population, when differentiating men and women, that relationship is significant only in men. The differences found reflect the need to assess the influx of impulsivity in men and women separately.

When assessing whether expectations affect the relationship between impulsivity and consumption (measured both, in quantity and frequency) it is manifestly evident that both variables act independently, coinciding with Martin (2011), Kuntsche et al. (2008) and Read et al. (2003). Results show a sparing model of the main simple effects between the specific impulsivity trait and the reason to carry out that consumption. Both variables seem to play different roles in the prediction of alcohol consumption between the university students assessed.

Important differences are appreciated when considering any intervention differentiating gender. On the one hand, the independent influx of impulsivity and expectations explaining the quantity of grams of alcohol ingested among men (it explains 20% of variance) should be considered. And, on the other hand, in women, the importance of expectations only to explain both, the quantity of consumption (10% of the variance of consumed grams) and the intensity (7% of frequency) should also be included.

Therefore, considering impulsivity and expectations jointly as predictors of consumption in men and women does not contribute to clarify the aim of psychosocial intervention. The results of the current work show the need to intervene on aspects related to impulsivity in ICA men and on the expectations associated to the consumption in the whole group with the same pattern of consumption.

In general, the motives for consumption show stronger relationships with the consumption of alcohol, whereas the personality variable shows more modest relationships (Martin, 2011). More concretely, the motives for improvement and for coping are stronger predictors for alcohol consumption than any other personality variable included (in that case, impulsivity) (Cooper, 1994; Hussong, 2003; Martín, 2011).

Thus, it is important to consider these motives for improvement, coping and social relations when identifying, preventing and dealing with university students in risk of performing ICA. The greatest proportion of the explained variance by the motives as opposed to by the personality traits stresses the importance of adapting the intervention and prevention programs to approach the concrete reasons given by the subjects why they drink. It is also important to underline that, theoretically, the motives can be more easily changeable in response to the interventions (Martin, 2011).

A recent meta-analysis of 62 works of intervention for university students who are alcohol consumers (Carey, Scott, Carey, & DeMartini, 2007) suggest that the treatments that obviated the change of expectations were less effective than those which did not. Besides, another revision of literature about alcohol consumption in university students (Ham & Hope, 2003) concluded that the interventions that approach personality and motives for consumption have more satisfactory results, in comparison with those which exclude the latter (Conrod, Stewart, Pihl, & Dongier, 2000).

Finally, it is important to underline the need, in the case of ICA women, to assess new variables that complete the variance explained by their consumption behavior, allowing thus to state the guidelines to guarantee an optimal intervention.

In the case of impulsivity, the option was to use the total scores of the Barrat scale due to the high scores in all cases, regardless of the fact that in one of the subscales some significant differences were found according to gender. Despite that, it would be interesting in future research to look into these possible differences in greater detail, using for that bigger samples and even more accurate assessment instruments that make possible to overcome social desirability missing in self-reports.

Another possible improvement to consider in future research would be the extension of the sample to include populations different to that of university students. This would facilitate the generalization of results.

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## Conflict of interests

There are no conflict of interests.

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