Predictors of weekly alcohol drinking and alcohol-related problems in binge-drinking undergraduates

Predictores del consumo semanal de alcohol y sus consecuencias asociadas en universitarios consumidores intensivos de alcohol

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Abstract

The important implications generated by binge drinking among university students justify the interest to determine which factors predict its occurrence. Specifically, this study aims to assess the role of personality and drinking onset in predicting weekly alcohol consumption, and the impact of the whole set of variables in predicting the number of consequences associated with consumption in undergraduates. Two hundred and thirteen freshmen who were intensive consumers (binge drinkers) from the University Complutense of Madrid were evaluated. All of them filled in a self-registration of consumption, the BIS-11, the NEO-FFI and the IECI consequences associated with intake. The hierarchical regression analysis shows that the drinking onset appears to be a relevant predictor variable in explaining weekly consumption and the number of consequences. The same can be said of the weekly consumption variable with regard to the number of consequences. In general, the influence of personality is quite limited. It is interesting to point out that responsibility and impulsivity, along with age, explain most of the weekly consumption behavior among males. With respect to the consequences of consumption, only impulsivity and neuroticism contribute to explain them, but with less strength than age and weekly consumption. Our results justify the need to plan tighter interventions and consider new predictors that help to explain further weekly consumption in women.

Key words: binge drinking, consequences, personality, drinking onset, university students.

Resumen

Las importantes implicaciones que genera el consumo intensivo de alcohol entre los jóvenes justifican el interés por determinar qué factores predicen su aparición. Concretamente, en este estudio se analiza el papel de la personalidad y edad de inicio en el consumo de alcohol en la predicción del consumo semanal de alcohol, y de todas estas variables en la predicción del número de consecuencias asociadas al consumo en jóvenes universitarios.

Se evalúan 213 consumidores intensivos de primer curso de la Universidad Complutense de Madrid. Todos ellos cumplimentaron un autoregistro de consumo, el BIS-11, el NEO-FFI y el IECI de consecuencias asociadas a la ingesta.

Los análisis de regresión de orden jerárquico muestran que la edad de inicio resulta ser una variable predictora relevante tanto en la explicación del consumo semanal como del número de consecuencias. Lo mismo puede decirse de la variable consumo semanal respecto a la del número de consecuencias.

En líneas generales, el influjo de las variables de personalidad es bastante limitado. Tan sólo mencionar la responsabilidad e impulsividad, que junto con la edad, llegan a explicar gran parte de la conducta de consumo semanal entre varones. En lo que respecta a las consecuencias derivadas del consumo, sólo resultan explicativas, aunque en menor medida que la edad y el consumo semanal, la impulsividad y el neuroticismo.

Esto justifica la necesidad de planificar intervenciones más ajustadas y de analizar nuevos predictores en el caso de las mujeres que permitan explicar en mayor medida su conducta de consumo semanal.

Palabras clave: consumo intensivo de alcohol, consecuencias, personalidad, edad inicio, universitarios.

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Intensive Alcohol Consumption, otherwise known as binge drinking, the consumption of 60 grams or more in men and 40 grams or more in women, over a period of between 2 and 3 hours – (Hingson, Assailly and Williams MSC, 2008; NIAAA, 2004) is a generalized practice among young people (Anderson and Baumberg, 2006), one that occurs widely among university students (Arata, Stafford and Tims, 2003; Calafat, 2007; Danielsson, Wennberg, Tengström and Romelsjö, 2010; March et al., 2010; Parada et al., 2011). Despite the fact that the number of males and females who binge drink is ever more homogenous, the former group continue to show higher indices both in the amount and frequency of consumption (Cortés, Giménez, Motos and Cadaveira, 2014; Gliksman, Adlaf, Demers and Newton, 2003; O'Malley and Johnston, 2002; Wechsler, Dowdall, Davenport and Castillo, 1995).

This pattern of consumption is associated with multiple biopsychosocial problems (Martens et al., 2005; Neighbors, Walker and Larimer, 2003; Park, 2004; Ray, Turrisi, Abar and Peters, 2009), among which the most important are symptoms of intoxication, problems with studies and at work, interpersonal problems, engaging in unprotected and unplanned sexual practices, driving under the influence of alcohol, becoming involved in fights, suffering injuries, having legal problems and even causing harm to third parties (Cortés, 2010; Devos-Comby and Lange, 2008; Hingson, Zha and Weitzman, 2009; Kahler, Strong and Read, 2005; Mallett et al., 2011; Shield, Gmel, Patra y Rehm, 2012; Wechsler and Nelson, 2010). The range and importance of these consequences show clearly the need to identify more accurately those young people who are at risk, which would provide a basis for interventions that are tailored to their needs (Cortés et al., 2014; Ibáñez, Ruipérez, Villa, Moya and Ortet, 2008).

One of the aspects of this problem that has aroused much interest in recent years is the relationship between personality variables in binge drinkers of varying intensity and frequency (Adan, 2012; Ibáñez et al., 2008; Woicik, Stewart, Pihl and Conrod, 2009) and the appearance of associated biopsychosocial problems (Cooper, Agocha and Sheldon, 2000; Ibáñez et al., 2008; Magid, MacLean and Colder, 2007; Mezquita, Stewart and Ruipérez, 2010; Ruipérez, Ibáñez, Villa and Ortet, 2006; Sher, Grekin and Williams, 2005). Specifically, it has been shown that traits included in the Five Factors of Personality (Costa and McCrae, 1992), are linked to problems associated with consumption, both in the population of clinical dependents (Hopwood et al., 2007; Sher, Trull, Bartholow and Veith, 1999), and in alcohol abusers (Littlefield, Sher and Wood, 2010; Flory, Lynam, Milich, Leukefeld and Clayton, 2002) and binge drinkers (Martin, 2011; Ruiz, Pincus and Dickinson, 2003). Among the factors that are most analyzed in the different types of consumers are Neuroticism and Extraversion (Martin, 2011; Mezquita et al., 2010; Read y O'Connor, 2006; Ruiz et al., 2003). Specifically, among the binge drinkers, high levels of Neuroticism correlate with a greater number of problems caused by alcohol consumption (Conrod, Stewart, Comeau and Maclean, 2006; Cooper, et al., 2000), which contributes significantly to the explanation of the variance of these problems (Cooper et al., 2000; Ruiz et al., 2003). On the other hand, Extraversion is shown to be directly related to variables that are relative to the pattern of consumption -the amount of alcohol consumed, the frequency- and contributes a specific weight to the prediction of the binge drinker (Hussong, 2003; Martin, 2011; Ruiz et al., 2003).

In other traits defined in the model, such as Agreeableness, previous research shows that a low score is usually associated with an increase in the amount of alcohol consumed by binge drinkers (Kubicka, Matjcek, Dytrych and Roth, 2001; Ibáñez et al., 2010; Mestre, Viñas, Dutil and Moya, 2004; Ruiz et al., 2003) as well as with the problems derived from this consumption among young university students (Ruiz et al., 2003). Nevertheless, some studies show contradictory results concerning the influence of Agreeableness on the consumption of binge drinkers (Hussong, 2003). The Consciousness trait shows similar behavior to that of Agreeableness, since the research also indicates an association between low scores in the dimension and an increase in consumption among binge drinkers (Ruiz et al., 2003). On the other hand, among binge drinkers, the Openness trait does not appear to be a significant predictor either of the amount of alcohol consumed or the problems caused by the same (Hussong, 2003; Ibáñez et al., 2010; Ruiz et al., 2003; Stewart, Loughlin and Rhyno, 2001). Thus, the personality profile that is characteristic of young binge drinkers could be defined by high scores in Neuroticism (Conrod et al., 2006; Cooper et al., 2000; Hussong, 2003; Littlefield, Sher and Wood, 2009; Martín, 2011; Ruiz et al., 2003; Stewart et al., 2001) and Extraversion (Cooper et al., 2000; Hussong, 2003; Martin, 2011; Littlefield et al., 2009; Ruiz et al., 2003) and low scores in Conscientiousness (Ibáñez et al., 2010; Ruiz et al., 2003; Stewart et al., 2001) and Agreeableness (Hussong, 2003; Ibáñez et al., 2010; Ruiz et al., 2003; Stewart et al., 2001).

One of the personality tools that has been most used in research related to alcohol consumption, including binge drinking, is the short form of the NEO Five-Factor Inventory (NEO-FFI, Costa y McCrae, 1992, 1999), which evaluates the personality traits of the Five Factor Model (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness), (Boyle, Matthews and Saklofske, 2008; Hussong, 2003; Mezquita et al., 2010; Ruiz et al., 2003; Stewart et al., 2001). Many researchers, however, warn of the need to complement this evaluation with a tool that takes into account the multidimensionality of the Impulsivity trait (Cyders, Flory, Rainer and Smith, 2009; Henges and Marczinski, 2012; Magid et al., 2007; Meda et al., 2009; Quilty and Oakman, 2004; Stanford et al., 2009; Whiteside and Lynam, 2001).

The literature has shown that there is a significant relationship between impulsivity and binge drinking (Adan, 2012; Field, Schoenmakers and Wiers, 2008; Goudriaan, Grekin, Sher, 2007, 2011; MacKillop, Mattson, Anderson, Castelda and Donovick, 2007; Prado, Crespo, Brenlla and Páramo, 2007; Simons, Carey and Gaher, 2004; White et al., 2011) and between this trait and the experience of negative consequences as a result of this consumption (Fischer and Smith, 2008; Littlefield et al., 2009; Ruiz et al., 2003; Simons, Gaher, Correia, Hunsen and Christopher, 2005; Simons et al., 2004). For all of that, together with the NEO-FFI, the application of Barratt's Impulsivity Scale (BIS-11, Patton, Stanford and Barratt, 1995) is recommended, as this is a tool that is used among consumers of this type (Balodis, Potenza and Olmstead, 2009; Carlson and Johnson, 2012).

As well as this, the role of gender in the relationship between personality and alcohol should not be omitted. Some studies indicate that the traits typical of Neuroticism are more characteristic among female consumers of different intensity levels, including binge drinkers, who tend to experience a greater number of alcohol-related problems (Locke and Newcomb, 2001; Martin, Lynch, Pollock and Clark, 2000; Schuckit, Tipp, Bergman and Reich, 1997; Schutte, Hearst and Moos, 1997). On the other hand, traits corresponding to Impulsivity seem to be more relevant among male consumers, including binge drinkers (Adan, 2012; Cortés et al., 2014; Fischer and Smith, 2008; Waldeck and Miller, 1997; Zuckermann and Kuhlman, 2000).

However, many studies suggest there are no statistically significant differences between male and female binge drinkers in terms of Neuroticism (Ruiz et al., 2003) and Impulsivity (Balodis et al., 2009; Magid et al., 2007; Ruiz et al., 2003; Simons et al., 2004). These results show the need to continue evaluating the role of gender in the relationship between different aspects of personality and alcohol consumption.

Finally, another additional variable to consider, owing to its link to the appearance of problematic consumption, including binge drinking, is the drinking onset, that is, the age at which consumption is initiated (Hingson, Heeren and Winter, 2006; Jenkins et al., 2011; Lo, 1996; Pitkänen, Lyyra and Pulkkinen, 2005; Warner and White, 2003; Warner, White and Johnson, 2007). In that regard, one can find studies that appear to demonstrate that relationship (Bonomo, Bowes, Coffey, Carlin and Patton, 2004; DeWit, Adlaf, Offord and Ogborne, 2000; Grant, Stinson and Harford, 2001; Hingson and Zha, 2009; Livingston, Laslett and Dietze, 2008; Muthen and Muthen, 2000; Pilatti, Caneto, Garimaldi, Del Valle and Pautassi, 2013), and others that cast doubts on it, linking it instead to other variables, among which are included personality traits (Afitska, Plant, Weir, Miller and Plant, 2008; Dawson, Goldstein, Chou, Ruan and Grant, 2008; Harford, 2003; Rossow and Kuntsche, 2013). This has meant that, at present, research continues into the influence of the drinking onset as a factor that possibly contributes to the increase in the probability of consequences appearing.

This paper aims, firstly, to analyze the predictive weight of the drinking onset and personality traits on the amount of alcohol that young, binge-drinking university students consume weekly. Secondly, the predictive weight of these same variables -age and personality traits- will be seen, together with that of the weekly alcohol consumption on the number of consequences experienced. At all times, the gender perspective will be considered.

Method

Participants and procedures

To select the sample group, a stratified sampling was carried out of the first-year student population at the Universidad Complutense de Madrid (Complutense University of Madrid, or UCM) during the 2011-2012 academic year, using data provided by the vice-chancellor's office of the university. Degree courses from each area of knowledge (Basic Sciences, Social Sciences, Health Sciences, Humanities and Educational Sciences) were selected based on the number of students enrolled, the campus on which the degree course was studied, and distributed by gender. In all cases at least one morning and one evening group was included. The questionnaires were completed in the classrooms and during class time (both morning and evening), with members of the research team always present. Participation in the study was voluntary, and participants were asked for a contact telephone number in order to call them in for the following stage. From all of the students surveyed, some 440 subjects were selected, none of whom had any history of psychopathological or neurological disorders; abuse or substance dependence (including alcohol), or a family history of first-degree relative with alcoholism. Half of them were binge drinkers and the rest were either non-drinkers or consumers of small amounts, well below what is considered a binge drinker. After signing an informed consent form, among all of the multiple aspects evaluated, their consumption patterns were recorded, along with their cognitive and personality determinants. The data presented here form part of a longitudinal cohort study as neuropsychological evaluation was also included, even though, as this paper focuses solely on data obtained in the first stage of the research it could be said that information from a cross-sectional analysis is also used. Specifically, the results obtained from the 123 students who engage in binge drinking (MSC, 2008) are evaluated. 56.8% of the sample group are female (n = 21). The average age is 18.20 years (SD = .414).

Variables

Drinking onset. The age at which alcohol consumption begins is indicated.

Consumption patterns. The number of times in which alcohol is consumed over the last six months is registered. The number of drinks consumed each day of a week of habitual consumption over those six months is noted in an ad hoc table, following a procedure that is similar to that employed by Neighbors, Lee, Lewis, Fossos and Larimer (2007). The type of alcohol consumed and the time of day at which each consumption occurs are also registered. All of this information allows for the grams of alcohol consumed with each drink to be calculated, taking as a reference the Standard Drink Units in Spain (Rodríguez-Martos, Gual and Llopis, 1999). From these data, different variables are generated: total of alcohol consumed per week (the result of adding together the grams of alcohol consumed each day of the week, extracted from the self-register of consumption) and type of consumption (binge drinking-non-binge drinking). To obtain this last variable, the maximum number of grams consumed over a period of two to three hours of greatest consumption is calculated, with those males who drink 60 or more grams of alcohol, and the females who reach 40 or more grams being labelled as binge drinkers (MSC, 2008).

Personality traits. The Spanish version (Cordero, Pamos and Seisdedos, 2008) of Costa and McCrae's short form of the NEO-FFI Personality Inventory (1999). It consists of 60 items which evaluate the Five-Factor Model of personality (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness), by means of a 5-point Likert response scale ranging from 0 (totally disagree) to 4 (strongly agree). In this study, the T scores of the 5 scales have been used (the range of these scores varies between 25 and 75; a score of over 55 is considered high and one of over 65 is very high). This tool obtains good internal consistency in a great many studies of the binge-drinking university population – a Cronbach alpha of between 0.71 and 0.85- (Mezquita et al., 2010; Ruiz et al., 2003; Sanz, Silva and Avia, 1999). Impulsivity is measured by means of Barratt's BIS-11 tool (Patton et al., 1995; Spanish adaptation by Oquendo et al., 2001), made up of 30 4-point Likert-type items: 0 (never/rarely), 1 (occasionally), 3 (often) and 4 (almost always) that measure Cognitive, Motor and Unplanned Impulsivity. The sum of the scores of the latter three constitutes the Total Impulsivity scale used in this study (with a range of scores from 0 to 120). This tool has shown good internal robustness in the student drinking population –a Cronbach alpha of between 0.79 and 0.83- (Hair and Hampson, 2006; Patton et al., 1995; Stanford et al., 2009).

Consequences. These are evaluated with the corresponding section of the IECI tool (Cortés et al., 2012). The scale includes 30 items which refer to the different consequences that each young person says they experience as a result of drinking. They refer to physical symptoms (I have had a hangover, felt dizzy, vomited; etc.); loss of control (I have drunk more than planned; etc.); risky behavior (I have had unsafe sex; etc.); physical dependency (I need more alcohol than I did a few years ago; etc.); self-perception (Drinking alcohol makes me feel guilty; etc.); academic or professional consequences (I have neglected my responsibilities because of drinking; etc.); socio-interpersonal consequences (When I drink I say things that I later regret; etc.) and other consequences (I have money problems because of drinking; etc.). All of them respond by means of a dichotomous scale (Yes/No). This scale has shown goodness of fit in previous studies, reaching a Cronbach alpha of over .807 (Cortés et al., 2012; Motos, 2013). In this paper the sum of all the consequences that each young person says they have experienced in the last six months is used, and this constitutes the number of consequences variable (with a range of scores of between 0 and 30).

Data analysis

By means of the IBM SPSS Statistics 19 pack, descriptive analysis of the binge drinking, weekly consumption, drinking onset, personality traits and number of consequences variables for the general sample and by gender were carried out. In addition, in order to check for possible differences according to gender, mean comparisons were carried out (by means of the Student t test) on these same variables. Then, the zero-order correlations between number of consequences, weekly consumption, drinking onset, gender, the five NEO-FFI personality traits and Total Impulsivity were examined (by means of the Pearson correlation coefficient). This made it possible to confirm which elements were most strongly associated with consumption and its consequences and to identify variables that presented unforeseen bivariate relationships. As a prior step to the regression analyses, the Blom transformation (1958) was applied to all of the continuous variables used in the same (except the NEO-FFI), with the aim of avoiding bias in the frequency of the measurements and to maintain the coherence of the data. By this means the cases are ordered by range, each case's range becomes a percentile and the measures are finally normalized. The result is a *z* score of ranges, which reduces to a minimum the spurious impact of the extreme cases. Finally, three hierarchical regression analyses were carried out (one for the whole sample, and one for each gender) in order to detect the unique contributions of the *drinking onset, gender, Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness* and *Total Impulsivity* variables on the amount of alcohol consumed per week. These variables were introduced in eight separate steps. On the other hand, in order to predict the percentage of variance on the consequences, another hierarchical regression analysis was carried out. In this case, for the whole of the sample, owing to the fact that no differences by gender had been observed in the *t* tests or in the correlations. Specifically, the *drinking onset, grams per week, Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness* and *Total Impulsivity* variables were introduced in eight separate steps.

Results

Table 1 shows how both the males (121.63g) and the females (89.09g) consume double the grams of alcohol that define a binge drinker (60g-40g respectively). In addition, as can be appreciated in the difference between this intake and that reflected in the weekly grams of alcohol variable, they complement this intake with others, of smaller amounts, throughout the week. When the total weekly intake is considered, a third of the women and a quarter of the men exceed the limit fixed by the WHO (2007) to define the harmful weekly amount (280g in men, 170g in women). Looking at the gender differences, the same table shows how men consume a significantly larger amount of alcohol per week (209.24g *vs.* 152.77g; t=-4.042; p<.000), and during one binge-drinking session, than women (121.63g *vs.* 89.09g; t=-4.988; p<.000).

Contrary to this, no significant differences are appreciated either in the drinking onset or the number of consequences experienced. Looking at the personality traits, it is the males who obtain a significantly higher mean in Agreeableness (58.82 *vs.* 53.23; t=-6.209; p<.000) and Impulsivity (47.43 vs. 43.64; t=-2.201; p<.029). In general, the personality scale scores may be considered as high, with Neuroticism, whose profile is defined as very high, standing out from the rest, according to the NEO-FFI scale. No gender differences are observed in Neuroticism, Openness, Extraversion or Conscientiousness.

Table 1.
Consumption variables, number of consequences and personality traits, differentiated by gender.

Item	Mean	Sd	Males (M, sd)		Females (M, sd)		t	p
Drinking onset	14.94	1.25	15.10	1.37	14.83	1.13	-1.538	.126
Weekly grams of alcohol	177.16	99.89	209.24	115.14	152.77	78.65	-4.042	.000
Grams in one binge-drinking session	103.15	47.37	121.63	54.35	89.09	35.54	-4.988	.000
Number of consequences	7.79	3.53	8.22	3.58	7.47	3.46	-1.534	.126
Personality traits								
Neuroticism	69.77	4.48	70.30	3.69	69.38	4.97	-1.540	.125
Extraversion	58.95	5.35	59.28	4.96	58.70	5.64	-0.783	.435
Openness	62.22	6.51	62.62	6.22	61.92	6.74	-0.778	.437
Agreeableness	55.63	7.04	58.82	6.32	53.23	6.61	-6.209	.000
Conscientiousness	58.44	6.60	57.98	6.83	58.79	6.42	0.878	.381
Total Impulsivity	45.28	12.58	47.43	11.83	43.64	12.94	-2.201	.029

The first column of Table 2 shows the correlations of the amount of alcohol consumed weekly with the drinking onset, gender and the NEO-FFI and BIS-11 personality traits, for the general sample. The drinking onset shows a negative correlation with the amount of alcohol consumed in a week. By contrast, gender correlates in a positive way with consumption. For that reason, hierarchical regression analyses by gender were carried out. The second column of Table 2 shows the correlations between the consequences experienced with the drinking onset, gender, grams consumed weekly and the NEO-FFI and BIS-11 personality traits, for the general sample. Weekly consumption correlates positively and significantly with the number of consequences experienced. Against this, the drinking onset shows a negative relationship, as in the previous case. Impulsivity, for its part, correlates more strongly with consequences derived from consumption. In this case no differences appear in terms of gender, for which reason no further separate hierarchical regression analyses were performed.

Tabla 2.
Correlations between consumption and personality traits with weekly consumption and the number of consequences.

	Weekly grams	No. of consequences
Drinking onset	-.267**	-.288**
Gender	.281**	.091
Weekly grams	-	.332**
Personality traits		
Neuroticism	-.040	.154*
Extraversion	.078	.135*
Openness	.120*	.008
Agreeableness	.180**	.152*
Conscientiousness	-.111	-.061
Total Impulsivity	.185**	.310**

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

Tables 3, 4 and 5 present the results of the hierarchical regression analyses carried out to predict the amount of alcohol consumed weekly, both for the overall sample and for each of the sexes. Only the drinking onset and gender variables turn out to be significant for the overall sample, which explains variances of 4.8% and 9.6% respectively. In the case of the first variable, the contribution of the variance is also significant for both sexes, being greater in males (10.6%). As well as this, Conscientiousness and Impulsivity are significant for males. The amount of variance that they contribute to the prediction of weekly consumption is of 9.4% and 6.9% respectively. Among the females, only the drinking onset, with an explained variance of 3.8%, stands out. The highest percentage of explained variance of weekly consumption is that obtained by the males (30.4%). This percentage is eleven points higher than that of the overall sample (19.4%) and ten points higher when compared with that of the females (9.5%).

Table 3.
Hierarchical regression analyses to predict weekly consumption in the overall sample.

						Step 1		Step 2		Step 3		Step 4		Step 5		Step 6		Step 7		Step 8	
	R	R^2	Error estimation	ΔR^2	$F\Delta R^2$	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β
1	.218	.048	.798	.048	10.266**	-.218	-3.204**														
2	.380	.144	.759	.096	22.968***	-.254	-3.895***	.312	4.793***												
3	.394	.155	.756	.011	2.608	-.239	-3.643***	.295	4.480***	.106	1.615										
4	.402	.161	.755	.006	1.555	-.246	-3.738***	.262	3.709***	.097	1.465	.088	1.247								
5	.412	.170	.753	.009	2.063	-.253	-3.844***	.269	3.801***	.084	1.266	.066	.909	.096	1.436						
6	.421	.177	.751	.008	1.843	-.252	-3.848***	.262	3.704***	.073	1.085	.073	1.010	.100	1.501	-.08	-1.35				
7	.427	.182	.751	.005	1.132	-.259	-3.932***	.262	3.700***	.060	.877	.070	.963	.090	1.341	-.11	-1.564	.073	1.064		
8	.441	.194	.747	.012	3.002	-.262	-3.990***	.264	3.754***	.069	1.011	.088	1.212	.093	1.379	-.09	-1.460	.096	1.386	-.12	-1.733

Note: *Step 1. Drinking onset; Step 2. Gender; Step 3. Total Impulsivity; Step 4. Agreeableness; Step 5. Openness; Step 6. Consciousness; Step 7. Extraversion; Step 8. Neuroticism*
* $.01 < p \leq .05$ ** $.001 < p \leq .01$ *** $p \leq .001$

Table 4.
Hierarchical regression analyses to predict weekly alcohol consumption in males.

						Step 1		Step 2		Step 3		Step 4		Step 5		Step 6		Step 7	
	R	R^2	Error estimation	ΔR^2	$F\Delta R^2$	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β
1	.326	.106	.8137	.106	10.204**	-.326	-3.194**												
2	.448	.200	.7741	.094	10.014**	-.302	-3.106**	-.308	-3.164**										
3	.519	.270	.7442	.069	7.976*	-.220	-2.241*	-.313	-3.347**	.276	2.824**								
4	.535	.286	.7403	.016	1.897	-.225	-2.306*	-.296	-3.153**	.298	3.024**	-.131	-1.377						
5	.548	.301	.7371	.015	1.718	-.235	-2.408*	-.273	-2.878**	.296	3.020**	-.167	-1.696	.128	1.311				
6	.549	.302	.7411	.001	.112	-.236	-2.408*	-.275	-2.878**	.295	2.985**	-.168	-1.689	.123	1.239	.032	.335		
7	.551	.304	.7445	.002	.257	-.239	-2.423*	-.283	-2.909**	.289	2.895**	-.176	-1.743	.124	1.242	.036	.377	.050	.507

Note: *Step 1. Drinking onset; Step 2. Consciousness; Step 3. Total Impulsivity; Step 4. Neuroticism; Step 5. Openness; Step 6. Agreeableness; Step 7. Extraversion*
* $.01 < p \leq .05$ ** $.001 < p \leq .01$ *** $p \leq .001$

Table 5.
Hierarchical regression analyses to predict weekly alcohol consumption in females.

						Step 1		Step 2		Step 3		Step 4		Step 5		Step 6		Step 7	
	R	R^2	Error estimation	ΔR^2	$F\Delta R^2$	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β
1	.195	.038	.7158	.038	4.619*	-.195	-2.149*												
2	.248	.062	.7100	.024	2.922	-.217	-2.386*	.155	1.709										
3	.259	.067	.7109	.006	.701	-.221	-2.428*	.132	1.386	.079	.837								
4	.274	.075	.7110	.008	.956	-.220	-2.411*	.158	1.597	.074	.776	-.092	-.978						
5	.297	.088	.7092	.013	1.594	-.225	-2.467*	.149	1.505	.043	.436	-.119	-1.239	.123	1.262				
6	.306	.094	.7101	.006	.699	-.220	-2.410*	.134	1.333	.033	.330	-.122	-1.274	.122	1.252	.078	.836		
7	.309	.095	.7126	.002	.228	-.223	-2.430*	.142	1.390	.041	.412	-.120	-1.239	.125	1.280	.065	.661	-.047	-.478

Note: *Step 1. Drinking onset; Step 2. Extraversion; Step 3. Openness; Step 4. Neuroticism; Step 5. Agreeableness; Step 6. Conscientiousness; Step 7. Total Impulsivity*
* $.01 < p \leq .05$ ** $.001 < p \leq .01$ *** $p \leq .001$

Table 6 presents the results for the overall sample of the hierarchical regression analyses to predict the consequences derived from the consumption of alcohol. The total model contributes 20.2% to the prediction of the variance. The variable that explains the greater percentage of variance is the drinking onset (6.9%). This is followed by weekly consumption (5.2%) and the Impulsivity and Neuroticism traits with 4.4% and 1.8% respectively.

Table 6.
Hierarchical regression analyses to predict the number of consequences derived from binge drinking, in the overall sample

						Step 1		Step 2		Step 3		Step 4		Step 5		Step 6		Step 7		Step 8		Step 9	
	R	R^2	Error estimation	ΔR^2	$F\Delta R^2$	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β
1	.263	.069	.8744	.069	15.177***	-.263	-3.896***																
2	.348	.121	.8517	.052	12.048**	-.212	-3.145**	.234	3.471**														
3	.405	.164	.8324	.044	10.567**	-.193	-2.925**	.199	2.994**	.213	3.251**												
4	.428	.183	.8252	.018	4.565*	-.195	-2.977**	.208	3.148**	.192	2.930**	.137	2.137*										
5	.435	.190	.8239	.007	1.658	-.209	-3.153**	.190	2.824**	.183	2.776**	.120	1.828	.087	1.288								
6	.441	.194	.8234	.005	1.230	-.218	-3.265**	.184	2.725**	.173	2.604**	.103	1.532	.084	1.253	.074	1.109						
7	.441	.194	.8255	.000	.003	-.218	-3.225**	.183	2.611**	.173	2.585**	.103	1.524	.083	1.165	.074	1.108	-.070	-1.067				
8	.443	.197	.8264	.002	.524	-.220	-3.249**	.178	2.521*	.165	2.436*	.105	1.557	.087	1.209	.085	1.240	.002	.026	-.05	-.724		
9	.449	.202	.8259	.005	1.267	-.214	-3.145**	.186	2.621**	.173	2.537*	.108	1.590	.102	1.401	.095	1.367	-.005	-.068	-.047	-.699	-.076	-1.126

Step 1. Drinking onset; Step 2. Weekly consumption; Step 3. Total Impulsivity Total; Step 4. Neuroticism; Step 5. Agreeableness; Step 6. Extraversion; Step 7. Gender; Step 8. Conscientiousness; Step 9. Openness
* $.01 < p \leq .05$ ** $.001 < p \leq .01$ *** $p \leq .001$

Discussion

The data concerning consumption analyzed in this sample confirm the tendency that had been observed in previous papers (Cadaveira, 2010; Cortés, 2012; Cortés et al., 2014; White, Kraus and Swartzwelder, 2006), which point to the homogenization of a pattern of binge drinking among young people that reaches double the grams of alcohol required to define it. It is important to point out that these young binge drinkers do not consider themselves to be consumers at weekly risk as defined by the WHO (2007), hence, it is difficult to be able to identify them if weekly consumption is considered (Cortés, Motos and Giménez, 2013). The young people present high scores in the five factors evaluated, so two aspects can be highlighted. On the one hand, a relationship between all of them that is similar to that outlined in the introduction is observed (Conrod et al., 2006: Cooper et al., 2000; Hussong, 2003; Ibáñez et al., 2010; Littlefield et al., 2009; Martín, 2011; Ruiz et al., 2003; Stewart et al., 2001), since the highest scores are to be found in Neuroticism and Extraversion, with those of Agreeableness and Conscientiousness being secondary. This means that the binge drinker can be defined as a person with emotional reactions that may unbalance him, making him act in an irrational and even rigid manner. In addition, he would be sociable, a party-lover, with a need to talk to people but, at the same time, impulsive, carefree and with a tendency to be aggressive on occasions.

Altruism, sensitivity towards others, self-discipline and efficiency, while present, would not tend to represent these young people with the same level of intensity. The other aspect to highlight is that, unlike in other research projects (Hussong, 2003; Ibáñez et al., 2010; Ruiz et al., 2003; Stewart et al., 2001), in this case the evaluation of the influence of the Openness trait is not ruled out, as it shows itself to be as relevant as the rest. This result is not surprising if it is borne in mind that the sample studied was a group of first-year university students, for which reason one might expect of them attitudes and competences which are in keeping with a wide range of interests and critical thought.

In attempting to elucidate possible gender differences among the personality factors evaluated, the result obtained in Neuroticism tends to confirm the research carried out by Ruiz et al. (2003), indicating in this way the well-known importance of this trait among all binge drinkers. In addition, the difference found between males and females in Agreeableness means that new information that allows for a more precise description of the male binge drinkers as young persons with a more trusting and altruistic character than the female binge drinkers of the same age can be nuanced. On the other hand, the differences observed in Impulsivity support part of prior research (Adan, 2012; Cortés et al., 2014; Fischer y Smith, 2008; Waldeck y Miller, 1997; Zuckermann y Kuhlman, 2000) that highlights the greater probability that young male binge drinkers behave without thinking, live for the moment and have a short attention span. One of the most important contributions of this study has been the attempt to determine the weight or value that each of these dimensions may have when it comes to explaining consumption behavior among binge drinkers and the psychosocial consequences derived from the same.

Until now, most research has been limited to identifying dimensions in which these young people are conspicuous, but without attempting to assess the predictive level of each of them. For this reason, the primary objective of this study was to determine the predictive value of the drinking onset for drinking and of the personality traits on the weekly consumption of alcohol. Taking the sample as a whole, the drinking onset stands out as a variable with a greater predictive influence, while no explanatory value is obtained for any of the personality traits evaluated, unlike what is sustained by other research (Hussong, 2003; Ibañez et al., 2010; Martin, 2011; Ruiz et al., 2003). But it would be a mistake to focus only on this result and not give importance to the relevance of the gender variable in this prediction. Not to nuance the comment made regarding the function of gender would be to mask the weight that some personality traits do have. In this case the explicative importance that both the drinking onset and the Consciousness and Impulsivity traits have among males should be highlighted. Specifically, the explanatory weight of both exceeds that obtained in other research (Ibáñez et al., 2008, 2010; Martín, 2011). A different situation can be appreciated among females, since despite obtaining high scores for the personality dimensions none of them appear to have a relevant weight when it comes to explaining and justifying their alcohol consumption. These results warn of the importance of encouraging among males activities that work on their sense of duty, improve their time-management and establish limits or self-control on impulsive or aggressive responses.

On the other hand, it is useful to continue looking into new variables that will allow the explained variance of the consumption pattern among females to be increased, thus making it easier to lay down guidelines that guarantee a more optimal intervention. In addition, given that it has been shown that the drinking onset has an important influence on the amount of alcohol consumed weekly by binge drinkers, and bearing in mind that this is the main pattern of consumption among university students at the moment (OED, 2012, 2013), this supports the need to continue fostering the use of all those measures which prove to be universally effective in prevention to achieve the goal of delaying the drinking onset of alcohol consumption. Among these measures are those referring to alcohol consumption policies, be they legal controls, the raising of prices and taxes, or the reduction of the amount of advertising (Babor et al., 2003; EMCDDA, 2009; Villalbí and Gual, 2009), as well as those that foster the development of interpersonal relationship skills, resistance to peer pressure, improving conflict resolution or increasing self-esteem (CSAP, 2004). The importance of intervening at the same time in the social agents that surround young people, especially the parents, cannot be left aside, with the aim of encouraging changes in attitudes that are favorable to alcohol and the improvement of communication within families (CSAP, 2004; SMAHSA, 2010).

Another of the aims of this study was to evaluate the predictive capacity of the age of onset of alcohol consumption, the personality traits and the grams of alcohol consumed weekly on the number of consequences experienced. The result obtained defines, as was expected, that the drinking onset of alcohol consumption (Benton et al., 2006; Grant et al., 2001; Larimer, Turner, Mallett and Geisner, 2004; Muthen and Muthen, 2000), and the amount of this substance consumed (Neighbours et al., 2007) are the variables with the greatest explanatory power. But, together with these variables, although of less weight, the explanatory importance of Impulsivity and also Neuroticism is confirmed, clearly indicating the tendency observed in the papers reviewed (Conrod et al., 2006: Cooper et al., 2000; Fisher y Smith, 2008; Littlefield et al., 2009; Ruiz et al., 2003; Simons et al., 2005; Simons et al., 2004). This reality shows the need to work on, for all types of binge drinkers, with the aim of diminishing the incidence of negative consequences, a set of proposals concerning the management of skills to face situations of stress, among which could be activities that reinforce impulse control and foster the capacity to deal with anxiety, hostile reactions and negative emotional states.

An example of an intervention program that directly impacts on some of the variables included in the Neuroticism trait is that carried out by Conrod et al. (2006) and Conrod, Castellanos-Ryan and Mackie (2008, 2011) with young binge drinkers. The efficacy of this program in reducing the amount of alcohol consumed, in binge drinking and in the probability of experiencing problems derived from consumption has been shown on numerous occasions (Conrod et al., 2006; Conrod et al., 2008, 2011; O'Leary-Barrett, Mackie, Castellanos-Ryan, Al-Khudhairy and Conrod, 2010). However, Conrod himself warns that despite the growing evidence to support a personality-based approach to the prevention of alcohol consumption, there are still significant gaps, principally concerning everything that surrounds the generalization that short-term effects on alcohol consumption can be translated into a reduction of the risk of experiencing long-term problems (Conrod et al., 2011). This study presents a series of limitations that must be pointed out. Firstly, the participants are university students, which means questioning the generalization of its results to all young people of a similar age. It would be useful to carry out studies with young people who are both university students and not university students, although the difficulties of gaining access to the latter group should not be dismissed.

Secondly, estimations of alcohol consumption are based on self-reporting and not on objective measurements, with the bias that this may introduce. There is, in addition, a limitation that goes beyond the scope of this paper but which may be important to bear in mind, and that is that there is still no international consensus on a definition of binge drinking. This heterogeneity leads to some to estimate binge drinking in terms of a number of drinks but wi-

thout specifying the period of time over which consumption takes place or whether the alcohol drunk is of low or high graduation; others to estimate it according to the number of grams consumed but over a 2-3-hour period, and still others to calculate it in terms of the number of times binge drinking has occurred in recent months, etc. This situation often leads to comparisons being made of results obtained from highly heterogeneous subjects, who have been included all together under the same denomination. This points to the need to reach agreement on the definition of the binge drinker in as rigorous way as is possible. Finally, given that the variables included in this study only allow for part of the consumption patterns and the consequences derived from the same to be understood, it would be interesting to look into other possible explanatory variables, such as the perceived norms regarding alcohol intake within the ambit of the drinker (Neighbors et al., 2007) or the motives for consumption (Martín, 2011; Mezquita et al., 2010), which have shown their efficacy independently.

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Conflict of interests

There are no conflicts of interests in connection with this article.

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