

# Own and others' perceived drinking among freshmen as predictors of alcohol consumption over 10 years

## *Percepción del consumo de alcohol propio y de allegados en universitarios de primer curso como predictor del consumo a 10 años*

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### Abstract

The alcohol use perceptions young people have of those close to them can affect their expectations regarding alcohol and, thus, their own drinking. We aim to identify the predictive ability of own and significant others' perceived drinking at age 18-19 in the alcohol use patterns at 27-28. A cohort study was carried out among university students in Spain (n=1,382). Binge Drinking (BD) and Risky Consumption (RC) were measured with the Alcohol Use Disorders Identification Test at ages 18, 20, 22, 24 and 27. Multilevel logistic regression for repeated measures was used to calculate the adjusted Odds Ratios (ORs). College students perceive their family's alcohol consumption as very low or nothing, while the perception of their own alcohol use or that of their friends is higher. Perceiving higher alcohol use among their siblings and friends increases the risk of BD for both sexes and RC for women. Living away from the parental home increases the risk of RC and BD. In conclusion, the perception of their friend's alcohol use at age 18-19 is the most influential variable in BD among both sexes and in RC among men throughout 10 years of follow-up. Parental alcohol consumption does not affect college student drinking patterns when friends and siblings are considered. Living with one's family acts as a protective factor. Preventive measures focused on young people should take a contextual approach and include those closest to them. *Keywords:* Heavy episodic drinking; Peers; Family; Emerging adulthood; Alcohol drinking in college.

### Resumen

El consumo percibido por los jóvenes de sus allegados puede afectar a las expectativas respecto al consumo de alcohol y de este modo, a su propio consumo. El objetivo del estudio ha sido identificar la capacidad predictiva de la percepción de consumo de alcohol propio y de los allegados al inicio del periodo universitario, en los patrones de consumo observados a lo largo de 10 años de seguimiento. Se ha llevado a cabo un estudio de cohortes en universitarios en España (n=1.382). Consumo Intensivo de Alcohol (CIA) y Consumo de Riesgo de alcohol (CRA) se midieron con el Test de Identificación de los Trastornos debidos al Uso de Alcohol (AUDIT) a los 18, 20, 22, 24 y 27 años. Se calcularon las Odds Ratios (ORs) con regresión logística multinivel para medidas repetidas. Los universitarios percibían bajo o nulo consumo de alcohol de sus familiares y mayor de sus amigos. Percibir mayor consumo de sus hermanos y amigos aumentó el riesgo de CIA en ambos géneros y de CRA en mujeres. Vivir fuera del domicilio familiar aumentó el riesgo de ambos patrones. En conclusión, la percepción del consumo de alcohol de amigos a los 18-19 años resultó la variable más influyente para el CIA en ambos géneros y el CRA en mujeres a lo largo de 10 años de seguimiento. El consumo de alcohol de los padres al inicio del periodo universitario parece no afectar a los patrones de consumo practicados durante la juventud, una vez se ajusta por el consumo de amigos y hermanos. Vivir en el domicilio familiar actúa como factor protector. Las medidas preventivas en los jóvenes deben tener un enfoque contextual incluyendo a sus allegados. *Palabras clave:* Consumo intensivo de alcohol; Amigos; Familia; Jóvenes adultos; Consumo de alcohol en universitarios.

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**B**inge drinking (BD) has replaced other more traditional forms of alcohol use among young people in Mediterranean countries (Galán, González & Valencia-Martín, 2014; Martinotti et al., 2017). This pattern has been defined as the intake of large amounts of alcohol in a short period of time, with blood alcohol concentrations reaching at least 0.8 g/ l (Ministerio de Sanidad y Consumo, 2008; National Institute on Alcohol Abuse and Alcoholism, 2004).

There is a general tendency to consider this form of drinking as a characteristic of young people and their period of transition to adulthood, as occurs with other risky behaviours (Bava & Tapert, 2010; Chassin, Pitts & Prost, 2002; Crundall, 1995; Schulenberg, O'Malley, Bachman, Wadsworth & Johnston, 1996). However, the paucity of longitudinal studies in Europe on BD among young people in Mediterranean countries does not allow us to confirm the transitory nature of this consumption pattern. In other contexts, some authors have observed how some of the young people who practise BD during adolescence maintain these patterns during their youth and even in the first years of adulthood (Jefferis, Power & Manor, 2005; Meier, 2010; Patrick et al., 2019).

Our research team followed a cohort of young university students, the "Compostela Cohort", in the north-western region of Spain over 10 years. This follow-up made it possible to verify that BD practices at age 27 are not as low as expected (Moure-Rodríguez et al., 2016). These data, together with the negative consequences of these uses in adolescence (Cservenka & Brumback, 2017; Newbury-Birch et al., 2009; World Health Organization, 2018;), show the need to address these behaviours.

University students are a population with high prevalences of BD, both in our cohort and in other studies (Merrill & Carey, 2016; Moure-Rodríguez et al., 2016; Moure-Rodríguez et al., 2018). Among the variables linked to this practice we can highlight age of alcohol initiation, sex, and place of residence (Moure-Rodríguez et al., 2016; Wicki, Kuntsche & Gmel, 2010). Previous studies, mainly in the US, have shown that living away from the family home or living on campus represents a greater risk of these practices, with campus being considered a "wet" environment where alcohol is accessible, and peers may have greater influence (Benz et al., 2020; Simons-Morton et al., 2016). Results of studies with university students in Europe, however, are not so clear – there are differences regarding the university context that can shape these relationships in different ways (Kuntsche et al., 2004).

Young university students' expectations regarding alcohol use at age 18 have been shown to be an explanatory variable of RC and BD in the Compostela 2005 Cohort (Moure-Rodríguez et al., 2016; Moure-Rodríguez et al., 2018). The modifiable nature of this variable justifies the scientific community's interest in it, with research fo-

cused on modifying the expectations of young people by increasing negative and decreasing positive expectations aimed at reducing their alcohol use (Monk & Heim, 2013; Scott-Sheldon, Terry, Carey, Garey & Carey, 2012;). However, although some interventions have managed to modify young people's expectations with regard to drinking, this has not led to changes in use beyond the first month after the intervention (Scott-Sheldon et al., 2012).

Expectations can be defined as the set of implicit or explicit beliefs an individual has regarding the consequences of drinking, despite not yet having any personal experience of alcohol (Miller, Smith & Goldman, 1990). According to Critchlow (1986), they are probably generated by observation and cultural norms. As parents represent their closest environment and are their main agents of socialization during childhood, parental alcohol use will have a particular influence on young people's expectations and hence their alcohol use (Bahr, Hoffmann & Yang, 2005; Voogt et al., 2017). Nevertheless, we must not forget that adolescence tends to be a time in which ties and socialisation with peers are strengthened, as autonomy is gained and the time spent with parents decreases. Therefore, at these ages the influence of peers increases (Brown & Larson, 2009; Patrick & Schulenberg, 2013). As Oei and Morawska (2004) explain, when expectations – created as a result of parenting models, the influence of peers and even the media – become establish, they guide young people's behaviour regarding alcohol use, and this use in turn often confirms expectations.

Steinberg (2014) noted that although young people tend to disagree with parents, they normally agree on important issues such as safety and morality. Thus, while both the family context and peers seem to have an effect on young people's drinking (Sellers, McManama, Hernandez & Spirito, 2018; Wood, Read, Mitchell & Brand, 2004), these relationships may vary depending on age or cultural context. The influence of peers on drinking has frequently been addressed, but there is little evidence regarding the role of variables related to the family context in the university population (Windle, Haardörfer, Lloyd, Foster & Berg, 2017).

Taking this into account, our aim was to assess how the perception of first-year university students regarding alcohol use in their close social context – mother, father, siblings and friends – affects their drinking, not only during the first year of university but over nine follow-up years in our sociocultural context and always from a gender perspective.

## Method

### *Design, population and sample*

A cohort study with university students (Compostela Cohort 2005, Spain) was carried out between November

2005 and February 2015. Two-stage cluster sampling ensured that at least one first-year class was selected from each of the 33 faculties (a total of 53 classes) at the University of Santiago de Compostela. The number of classes selected in each faculty was proportional to the number of students. All students present in the classroom on the day of the survey were invited to take part in the study ( $n = 1,382$ ). The questionnaire was completed by 98.6% of the students present. Non-drinkers were excluded from the analysis, although they are included in the descriptive statistics. Subjects were informed both verbally and in writing (in the questionnaire) that participation was voluntary and anonymous and that they could drop out of the study at any time without consequences. The study was approved by the Bioethics Committee of the University of Santiago de Compostela.

### **Data collection**

Two research team members attended each freshman class in November 2005 and invited all students present in the classroom to participate in the study. In November 2007, the same researchers visited the third-year classes for a follow up of the participants; for the 4.5, 6.5 and 9 year follow-ups (2010, 2012 and 2015), they called those students who had provided their telephone number.

On all occasions, participants were assessed through anonymous questionnaires by matching the variables date of birth, sex, department or faculty and class.

The same questionnaires were used on all five occasions. Alcohol consumption was measured using the validated Galician version of the AUDIT (Saunders, Aasland, Babor, de la Fuente & Grant, 1993; Varela, Carrera, Rial, Braña & Osorio, 2006). At the same time, another questionnaire was administered covering factors potentially related to alcohol use (level of maternal education, problems related to alcohol use, age of alcohol initiation, place of residence, expectations regarding drinking and perception of own use that of close friends and relatives). To measure expectations, the participants had to order fourteen expectations regarding alcohol use (e.g., it increases fun, makes it possible to forget problems, causes anxiety, makes you feel depressed), based on the items of a questionnaire previously administered to young people in Spain (Defensor del Menor de la Comunidad de Madrid, 2002). Perceptions were measured on a Likert-type scale with 4 categories (more details on data collection in Moure-Rodríguez et al., 2016).

### **Definition of variables**

#### *Independent variables*

The following sociodemographic variables were included: sex, place of residence (parental home / outside the parental home), mother's and father's level of education

(primary / secondary / university), age of alcohol initiation (over 16, at 16, at 15, under 15 years of age).

Positive expectations. Based on the number of positive and negative expectations reported, a scale of 0 to 14 was created (0 = highest negative expectations, 14 = highest positive expectations). Scores were classified into tertiles, with the highest tertile corresponding to the subjects with the highest score in positive expectations. This variable was dichotomised by coding the upper tertile as 1 and the middle and lower tertiles as 0.

Perception of alcohol use: Perception of own alcohol use, that of friends, siblings, mother and father at 18 years of age, measured on a Likert scale of 4 categories: none, a little, quite a lot, a great deal.

#### *Dependent variables*

- 1) Risky Consumption (RC): Dichotomous variable generated from the total AUDIT score. Sex-based cut-off points were established at  $\geq 5$  for women and  $\geq 6$  for men, following the recommendations of the validated Galician version of AUDIT (Varela et al., 2006).
- 2) Binge Drinking (BD). Dichotomous variable based on the third AUDIT question "How often do you drink 6 or more alcoholic beverages on one occasion?", Coded as 0 = never, 0 = less than once a month, 1 = once a month, 1 = once a week, 1 = daily or almost daily. The sensitivity and specificity of this question with this cut-off point is 0.72 and 0.73 respectively, and the area under the curve is 0.767 (95% CI: 0.718 - 0.816). (Tuunanen, Aalto & Seppä, 2007).

### **Statistical analysis**

Multilevel logistic regression was performed for repeated measures to obtain the Odds Ratios (ORs) adjusted for the independent variables of the final BD and RC models. CIs (95%) were calculated for proportions and medians. As these models are more flexible than traditional ones, they allow us to work with interrelated data, a result of the same subject being assessed on several occasions, which means responses are strongly related in a dependency structure. Faculty and class were considered random effect variables. It was decided not to include missing data, since their distribution allows us to assume that there are no specific distribution patterns. Maximum models were generated including all the theoretical independent variables in accordance with the literature. Final models were constructed from these top models. Non-significant variables were eliminated from the model when their exclusion did not modify the coefficients of the other variables by more than 10% and the Akaike Information Criterion (AIC) value decreased. Data were analysed using generalised linear mixed models with the statistical package SPSS v.20.

## Results

The characteristics of the samples of women and men at 18 and 19 years of age are presented in Tables 1 and 2. As can be seen, there are no statistically significant differences for any of the variables in women or men.

Table 3 shows the perceptions of the participants' own drinking and that of those close to them. While only a third of the participants consider that their friends drink a little or no alcohol, this percentage rises to 68.1% when referring to their own drinking and reaches higher levels when referring to relatives, in excess of 90% in the case of parents. In this table, we can see the proportion of subjects with positive expectations based on their perception of alcohol use. A greater proportion of subjects who perceive that their friends, siblings, mother or even they themselves drink a lot have positive expectations regarding alcohol use, although the differences are not statistically significant.

Table 4 and Table 5 show the proportion of subjects who practice RC and BD at 18, 20, 22, 24 and 27 years of age according to the perception of own drinking and that of those close to them at age 18-19, separated by sex. We can observe a trend towards a greater proportion of subjects who practice both drinking patterns as the perception of use by relatives increases.

Figures 1 and 2 show the prevalences of RC at ages 18, 20, 22, 24 and 27 according to the perception of own drinking at 18 among women and men respectively. Figures 3 and 4 make it possible to compare RC trends of young university students aged 18 to 27 based on their friends' perception of use at 18. In all of these, a general downward trend and higher prevalences can be observed in participants with a high perception of their own drinking or that of their friends over the years.

Tables 6 and 7 present the results of RC and BD analyses in women and men respectively, adjusting for the variables included, as well as for maternal education level and age. The variables level of paternal education and level of maternal education did not yield an association with RC or BD.

The perception that friends drink large amounts of alcohol is related to both consumption patterns in women (OR = 17.5 for RC and OR = 19.3 for BD) and with the practice of BD in men (OR = 17.5).

The same association is found among those who perceive higher use in their siblings, with up to three times the risk of RC in women and 11 times greater risk in men (OR = 3.7 and OR = 11.6 respectively) and four times higher risk of BD in women and twice in men (OR = 4.5 and 2.8).

Perception of mothers' drinking does not affect the practice of these drinking patterns in female university students. However, the risk of RC is higher in the bivariate analysis among female university students who consider that their parents drink a little or quite a lot. This association is reversed if they consider that their parents drink a

great deal. Among male students, it is the perception that their mothers drink quite a lot of alcohol which increases the risk of practising RC (OR = 8.5); in the bivariate analysis, the perception of their parents' drinking is not associated with these behaviours.

With regard to the place of residence, living outside the family home increases the risk of practising both RC (OR = 1.9 in women and OR = 1.6 in men) and BD (OR = 1.7 in women and OR = 1.6 in men).

## Discussion

Young university students tend to perceive that their parents and siblings drink a little or no alcohol, while they consider their own alcohol use or that of their friends to be greater. As the perception of drinking by those close to them increases, the proportion of subjects practising RC and BD also increases. Thus, the risk RC and BD increases for university students of both sexes when they perceive that their siblings drink large amounts of alcohol. This association also exists with respect to the perception of drinking by their friends, but without the risk of RC in men. Regarding the perception of alcohol use by their fathers, this is only associated with an increase in RC among women, while the perception of mothers' drinking is linked to a higher risk of RC among men, as shown in both cases in the bivariate analysis. Finally, living outside the family home increases the risk of both drinking patterns in both men and women.

The high participation rate in this study (98.6% of students present in class on the first visit) permits a very positive assessment of the representativeness of the sample and hence the results obtained. Participation throughout the follow-up fell, from 1,363 subjects at first contact to 875 at the 2-year follow-up, 600 at 4 years, 347 at 6 years, and 415 at 9 years. However, as can be seen in Tables 1 and 2, there were no statistically significant differences in the baseline characteristics of the participants throughout the 9 years of follow-up, so it can be considered that the representativeness of the initial sample was not lost.

More than half of the participants considered that their friends drank quite a lot or a great deal of alcohol, which is in line with the high prevalences of drinking in young people reported in Spain (Ministerio de Sanidad, 2018a; Ministerio de Sanidad, 2018b) as well as in other countries, with one in every three young Europeans practising BD monthly (ESPAD Group, 2016; Farke & Anderson, 2007). In this regard, the prevalence of BD in the Compostela Cohort at 18 years of age is 17.9% and 35.6% for women and men respectively. In addition, university students tend to drink more alcohol and more intensely than their non-university peers (Center for Behavioral Health Statistics and Quality, 2015; Merrill & Carey, 2016; Quinn & Fromme, 2011;). Nevertheless, we must not forget that young peo-

Table 1. Characteristics of women at the beginning of the study in the initial sample and during follow-up.

	Percentage or mean (95% CI)					p-value
	Initial (18-19 years)	2-year follow-up (20-21 years)	4-year follow-up (22-23 years)	6-year follow-up (24-25 years)	9-year follow-up (27-28 years)	
	n = 992	n = 669(67.4%)	n = 461(46.5%)	n = 266(26.8%)	n = 325(32.8%)	
<b>Maternal education level</b>						
Primary	41.8 (38.4 - 45.3)	44.2 (40.1 - 48.4)	43.1 (38.3 - 48.3)	47.3 (41.3 - 54.1)	45.7 (40.1 - 51.8)	
Secondary	33.6 (30.2 - 37.1)	30.5 (26.4 - 34.7)	30.6 (25.8 - 35.8)	26.5 (20.4 - 33.3)	28.1 (22.5 - 34.2)	
University	24.6 (21.2 - 28.1)	25.3 (21.3 - 29.6)	26.3 (21.4 - 31.4)	26.1 (20.1 - 32.9)	26.2 (20.7 - 32.4)	0.642
<b>Age of alcohol initiation</b>						
Over 16	19.0 (16.5 - 21.8)	17.9 (14.9 - 21.3)	16.5 (13.0 - 20.5)	16.7 (12.1 - 22.5)	14.5 (10.5 - 19.2)	
At 16	38.9 (35.6 - 42.2)	38.1 (34.1 - 42.2)	36.8 (32.0 - 41.7)	40.1(33.6 - 46.8)	36.6 (30.9 - 42.6)	
At 15	25.6 (22.7 - 28.7)	25.9 (22.3 - 29.6)	26.5 (22.2 - 31.1)	26.4 (20.8 - 32.7)	28.3 (23.0 - 34.0)	
Under 15	16.5 (14.0 - 19.7)	18.1 (15.0 - 21.5)	20.3 (16.4 - 24.5)	16.7 (12.1 - 22.5)	20.7 (16.0 - 25.9)	0.438
<b>AUDIT (mean)</b>	5.4 (5.2 - 5.7)	5.6 (5.1 - 5.8)	5.6 (5.2 - 6.0)	5.6 (5.0 - 6.1)	5.3 (4.9 - 5.8)	0.884
<b>Perception of own alcohol consumption at 18-19</b>						
I do not drink	19.1	19.1	18.2	20.3	19.7	
I drink a little	53.7	53.2	54.0	54.9	54.5	
I drink quite a lot	23.1	23.2	23.2	20.7	22.5	
I drink a great deal	3.2	3.4	3.5	3.8	2.8	0.765

Table 2. Characteristics of men at the beginning of the study in the initial sample and during the follow-up.

	Percentage or mean (95% CI)					p-value
	Initial (18-19 years)	2-year follow-up (20-21 years)	4-year follow-up (22-23 years)	6-year follow-up (24-25 years)	9-year follow-up (27-28 years)	
	n = 371	n = 206(55.5%)	n = 139(37.5%)	n = 81(21.8%)	n = 90(24.2%)	
<b>Maternal education level</b>						
Primary	32.0 (26.5 - 37.8)	35.8 (28.4 - 43.3)	41.6 (32.8 - 50.8)	43.0 (31.6 - 54.8)	41.6 (31.5 - 53.5)	
Secondary	27.6 (22.1 - 33.3)	27.4 (19.9 - 34.9)	25.5 (16.8 - 34.7)	24.1 (12.7 - 35.8)	27.0 (16.8 - 38.9)	
University	40.3 (34.8 - 46.0)	36.8 (29.3 - 44.3)	32.8 (24.1 - 42.0)	32.9 (21.5 - 44.7)	31.5 (21.3 - 43.4)	0.449
<b>Age of alcohol initiation</b>						
Over 16	18.1 (12.5 - 24.1)	16.8 (9.2 - 24.7)	15.5 (6.9 - 25.5)	16.4 (6.0 - 29.7)	18.2 (7.8 - 30.3)	
At 16	36.9 (31.2 - 42.8)	41.0 (33.5 - 49.0)	44.0 (35.3 - 54.0)	50.7 (40.3 - 64.0)	48.1 (37.7 - 60.1)	
At 15	21.6 (15.9 - 27.5)	20.2 (12.7 - 28.2)	21.6 (12.9 - 1.6)	23.9 (13.4 - 37.2)	20.8 (10.4 - 32.8)	
Under 15	23.4 (17.8 - 29.4)	22.0 (14.4 - 30.0)	19.0 (10.3 - 9.0)	9.0 (0.0 - 22.3)	13.0 (2.6 - 25.1)	0.381
<b>AUDIT (mean)</b>	7.8 (7.2 - 8.4)	7.4 (6.6 - 8.2)	7.3 (6.4 - 8.2)	6.5 (5.4 - 7.6)	7.1 (6.0 - 8.2)	0.784
<b>Perception of own alcohol consumption at 18-19</b>						
I do not drink	16.2	18.9	20.1	19.8	17.8	
I drink a little	39.4	40.3	41.7	45.7	42.2	
I drink quite a lot	33.7	30.6	29.5	27.2	30.0	
I drink a great deal	9.4	9.2	8.6	7.4	10.0	0.830

ple, and specifically university students, tend to overestimate how much their peers and/or friends drink (Cox et al., 2019; Dumas, Davis & Neighbors, 2019), and our data may therefore be partly reflecting this overestimation.

The significant difference between the observed perceptions of their own drinking and that of their friends (Table 3), may also be influenced by a tendency to underestimate their own alcohol use. Gual et al. (2017) found

Table 3. Percentage of women and men with positive expectations regarding alcohol based on their perception of their own alcohol consumption, and that of their relatives

	Percentage with positive expectations (%)	
	Women n = 992	Men n = 371
<b>Perception of own alcohol consumption</b>		
I do not drink (18.3%)	13.7	14.3
I drink a little (49.8%)	25.5	24.8
I drink quite a lot (25.9%)	46.3	42.4
I drink a great deal (5.0%)	50.0*	55.2*
Missing (1.0%)		
<b>Perception of friends' alcohol consumption</b>		
None (1.8%) <sup>a</sup>	11.8	0.0
A little (29.3%)	20.8	25.8
Quite a lot (48.1%)	32.1	34.3
A great deal (19.9%)	36.8*	36.4
Missing (0.8%)		
<b>Perception of consumption siblings' alcohol</b>		
None (44.9%)	27.4	34.2
A little (28.2%)	26.6	31.8
Quite a lot (12.8%)	41.6	25.6
A great deal (2.7%)	44.4*	77.8*
Missing (11.5%)		
<b>Perception of mother's consumption</b>		
None (62.2%)	28.7	33.7
A little (35.5%)	28.7	29.8
Quite a lot (0.7%)	60.0	40.0
A great deal (0.2%)	-	-
Missing (1.3%)		
<b>Perception of father's consumption</b>		
None (32.4%)	28.4	35.4
A little (57.7%)	29.7	32.4
Quite a lot (6.6%)	28.1	23.1
A great deal (1.0%)	14.3	20.0
Missing (2.2%)		

Note.

<sup>a</sup> Percentages of subjects in the category of men and women combined.

\* Significant differences between exposure categories. Test  $\chi^2$ ,  $p < 0.05$ .

that up to 93.7% of risky drinkers do not see themselves as excessive drinkers. The data presented in Figures 1 and 2 seem to support this underestimation, since 35.9% of the women and 27.2% of the men who declared that they drank no or only a little actually show RC. Furthermore, almost all those who declared that they drank quite a lot or a great deal of alcohol at 18 years of age show RC at the

same age (95.0% of women; 96.9% of men); young people who consider that they drink quite a lot or a great deal of alcohol do not, therefore, seem to overestimate their own drinking.

The high percentage of participants who consider that their siblings drink little or no alcohol (73.1%) may be partly due to the fact that they are younger brothers or sisters. The lack of information in this regard prevents further consideration.

Regarding maternal drinking, practically 98% of the participants consider that their mothers do not drink or drink only a little alcohol; hence there is almost no variability in the responses. These data may be a partial reflection of the traditional drinking patterns practised by men (Galán et al., 2014; Wilsnack, Wilsnack & Obot, 2005), although sex differences in many countries are decreasing among the younger generations (ESPAD Group, 2016; Wilsnack et al., 2005).

Perceptions of paternal alcohol use are higher than those of maternal drinking, but lower than those of their own or of friends, and also lower than the prevalence of alcohol use among the Spanish population, around 63% (Ministerio de Sanidad, 2018b).

The low perceptions of parental drinking may be a result of its normalisation since, being the main social agents during childhood (Voogt et al., 2017), it is easy to see parental habits as examples of normality, despite international health recommendations. On the other hand, the way alcohol is used, in addition to being the usual one at home, is surely the traditional one in our social and cultural context – regular consumption accompanying meals. (Galán et al., 2014; Willett et al., 1995) – and probably different to the greater use, both in intensity and quantity, among young people. Although this explanation is not fully supported by the data from the ESTUDES national survey, which shows that adolescents ascribe a similar risk to drinking five or six alcoholic beverages at the weekends and consuming two alcoholic drinks every day (Ministerio de Sanidad, 2018a). Both circumstances may involve an underestimation of parental drinking.

The higher proportion of positive expectations regarding alcohol use among those subjects who have higher perceptions of drinking by their parents, siblings, friends and even their own reflects a parallel between these variables, reinforcing the relationship previously mentioned in the introduction of the manuscript. Thus, the directionality that we ascribe to this relationship leads us to see expectations – which have been influential in RC and BD both in the Compostela 2005 Cohort (Moure-Rodríguez et al., 2018) and in other groups of young people (Anderson, Grunwald, Bekman, Brown & Grant, 2011; Wicki et al., 2010) – as an intermediate variable in the model.

The temporal trend of these drinking patterns in young people generally follows a bell curve, reaching a peak

Table 4. Percentage of women who practise risky and binge drinking aged between 18 and 27 in relation to their perception of own consumption and that of those close to them at 18-19.

	Risky Consumption (%)					Binge Drinking (%)				
	Age					Age				
	18	20	22	24	27	18	20	22	24	27
<b>Perception of own alcohol consumption</b>										
I do not drink	1.6	8.6	4.8	1.9	3.1	0.0	1.6	1.2	1.9	0.0
I drink a little	48.0	49.0	42.6	11.0	18.1	9.9	9.6	12.0	5.5	1.7
I drink quite a lot	94.3	88.4	69.2	25.5	35.6	41.9	37.4	29	3.6	11.0
I drink a great deal	100*	100*	81.2*	10.0*	66.7	84.4*	78.3*	56.2	0.0	44.4*
<b>Perception of friends' alcohol consumption</b>										
None	5.0	5.3	8.3	0	11.1	0.0	5.3	0.0	0.0	0.0
A little	28.1	31.7	31.9	8.0	9.3	4.6	8.3	7.2	3.4	0.0
Quite a lot	62.2	60.1	46.8	12.9	23.8	20.3	15.3	18.2	4.5	4.3
A great deal	73.2*	75.2*	58.1*	21.1*	32.7*	40.5*	40.0*	25.7*	5.3	15.4*
<b>Perception of siblings' alcohol consumption</b>										
None	44.5	42.2	37.8	8.7	12.1	13.3	11.6	11.9	2.4	2.1
A little	47.0	51.8	42.5	12.5	23.3	15.7	16.9	17.3	4.7	7.0
Quite a lot	76.2	72.6	58.1	22.2	42.2	30.2	28.4	21.0	8.3	4.4
A great deal	87.0*	82.4*	81.2*	10.0	37.5*	52.2*	41.2*	25.0*	10.0	37.5
<b>Perception of mother's alcohol consumption</b>										
None	51.6	53.1	43.1	11.2	18.0	17.1	15.7	16.2	4.5	3.4
A little	51.6	50.2	42.2	12.0	25.9	19.1	19.3	13.6	3.6	7.1
Quite a lot	80.0	75.0	100	50.0	33.3	0	-	66.7*	-	-
A great deal	-	-	-	-	-	-	-	-	-	-
<b>Perception of father's alcohol consumption</b>										
None	47.5	48.7	34.7	10.8	14.0	17.2	16.4	14.3	4.8	1.9
A little	53.5	53.0	47.9	13.5	21.9	18.1	16.1	16.9	4.5	5.5
Quite a lot	55.7	65.9	50.0	9.5	38.7*	19.7	27.3	14.7	0.0	9.7
A great deal	12.5*	20.0	0.0*	-	-	12.5	0.0	-	-	-
<b>Total subjects</b>	51.5	52.2	43.2	12.2	20.9 <sup>^</sup>	17.9	16.7	15.7	4.1	4.9 <sup>^</sup>

Note.

\* Significant differences between exposure categories.  $\chi^2$ ,  $p < 0.05$ .

<sup>^</sup> Significant differences between ages. Test  $\chi^2$ ,  $p < 0.05$ .

and then beginning to decrease (Andersson, Johnsson, Berglund, & Ojehagen, 2007; Bewick et al., 2008). The results presented in this study show that those who think they and their friends drink a little or nothing reach peak consumption considerably later, at age 22, and even then, their drinking does not reach the RC of their peers. This indicates that a part of this subgroup of young people probably began such drinking patterns during their university period. Starting to drink in these ways at university is a phenomenon that has been observed by other authors (Weitzman, Nelson, & Wechsler, 2003) and indicates the importance of preventive measures during this vital period. It also reinforces the potentially protective effect of how friends use alcohol beyond the first year of university.

Turning to the multivariate analysis, the strongest association was found between the perception of friends' drinking and RC and BD in women and BD in men, which is in line with the literature, where college student drinking,

or even BD, can be predicted by the alcohol use of their peers (Borsari, Murphy & Barnett, 2007; Dumas, Davis, Maxwell-Smith & Bell, 2018; Robinson, Jones, Christiansen & Field, 2015). In this study we asked participants about the alcohol use of their friends, thus assessing the specific effect of the behaviour of their closest circle. It is logical to think that friends have a stronger effect on university students than their peers in general since they are the people with whom they spend the most time. This is consistent with the scientific literature, which has found that close friends or reference groups most similar to oneself have shown a greater influence on the alcohol use of young people (Larimer et al., 2009; Mallett, Bachrach & Turrissi, 2009). Thus, Larimer et al. (2009) conclude that carrying out feedback regarding the alcohol use of the reference groups with greater affinity would be more effective. Mallett et al. (2009) studied the perception of drinking by university students with respect to reference groups, students of

Table 5. Percentages of men who practise risky and binge drinking aged between 18 and 27 in relation to their perception of own consumption and that of those close to them at 18-19.

	Risky Consumption (%)					Binge Drinking (%)				
	Age					Age				
	18	20	22	24	27	18	20	22	24	27
<b>Perception of own alcohol consumption</b>										
I do not consume	3.3	15.4	14.3	6.2	0	1.7	5.1	21.4	0.0	.0
Little consumption	37.7	56.6	53.4	13.5	39.3	12.3	24.1	34.5	8.1	7.9
Considerable consumption	96.0	90.5	78.0	36.4	46.4	66.4	68.3	58.5	27.3	40.7
I consume a lot	100*	100*	83.3*	66.7*	14.3*	85.7*	78.9*	83.3*	83.3*	44.4*
<b>Perception of friends' alcohol consumption</b>										
None	20.0	-	-	-	-	0.0	0.0	-	-	-
A little	23.3	31.0	35.5	22.2	6.2	9.5	19.7	2.8	16.7	6.2
Quite a lot	58.8	68.4	58.1	20.5	37.2	32.4	37.0	41.9	15.4	23.3
A great deal	80.7*	77.4*	67.4*	26.1	37.9*	58.8*	58.1*	58.1*	21.7	24.1
<b>Perception of alcohol consumption by siblings</b>										
None	54.6	58.7	54.9	29.3	31.9	32.4	33.7	42.3	24.4	21.3
A little	57.8	59.1	54.8	18.2	15.5	41.0	36.4	45.3	13.6	20.0
Quite a lot	64.6	66.7	56.2	12.5	33.3	39.6	54.2	37.5	12.5	22.2
A great deal	100*	100*	80.0	-	-	71.4*	70.0*	80.0	-	25.0
<b>Perception of mother's alcohol consumption</b>										
None	56.9	63.7	52.5	22.2	30.8	33.8	45.2	41.2	14.0	19.2
A little	57.1	58.8	56.4	25.0	28.6	37.0	34.1	41.8	25.0	20.0
Quite a lot	100	-	-	-	-	80.0	33.3	-	-	-
A great deal	-	-	-	-	-	-	-	-	-	-
<b>Perception of father's alcohol consumption</b>										
None	54.8	65.5	56.8	34.8	33.3	32.7	44.2	43.2	26.1	29.2
A little	56.5	60.6	52.4	17.0	26.0	35.9	39.4	42.7	12.8	14.0
Quite a lot	80.0	68.4	64.3	33.3	50.0	43.3	26.3	35.7	33.3	40.0
A great deal	66.7	66.7	-	-	-	66.7	33.3	-	-	-
<b>Total subjects</b>	58.0	62.6	55.4	22.2	31.1 <sup>^</sup>	35.6	38.8	43.2	17.3	20.0 <sup>^</sup>

Nota.

\* Significant differences between categories of consumption perception.  $\chi^2$ ,  $p < 0.05$ .

<sup>^</sup> Significant differences between ages. Test  $\chi^2$ ,  $p < 0.05$ .

the same sex and friends, the latter group being the only one to influence the alcohol use of young participants. In these results, we can observe how the influence of a perception of higher alcohol use by friends at 18 years of age increases the risk of practising both drinking patterns over a 9-year follow-up, beyond the university period. This can also be seen in Figures 3 and 4, which show a clear difference in the prevalences of RC as a function of the perception of consumption by friends. Even despite the increase in prevalences of RC up to the age of 22 among those who considered their friends to be drinking a little or nothing at age 18, the prevalences remained below those of their peers throughout the follow-up period, and only matched them during the most important drop in RC, at age 24.

These results highlight the importance of acting on the perception of friends' drinking in alcohol prevention

programs during adolescence and youth, not only to prevent risky drinking in the first year of university, but also during subsequent years. In this sense, advertising directly targeting young people (with pictures of people their age drinking alcohol) is especially damaging. The regulation of advertising aimed at young people is an essential step to avoid the normalisation of alcohol use at these ages (Sargent & Babor, 2020).

Although the literature is not homogeneous in this regard, some authors have found evidence suggesting that women tend to be more influenced by the drinking of their friends. Along these lines, Simons-Morton et al. (1999) report that having problem friends increases the risk of drinking only in adolescent women, while Gaughan (2006) finds influences of drinking by friends of the opposite sex only among women. This may partly explain why

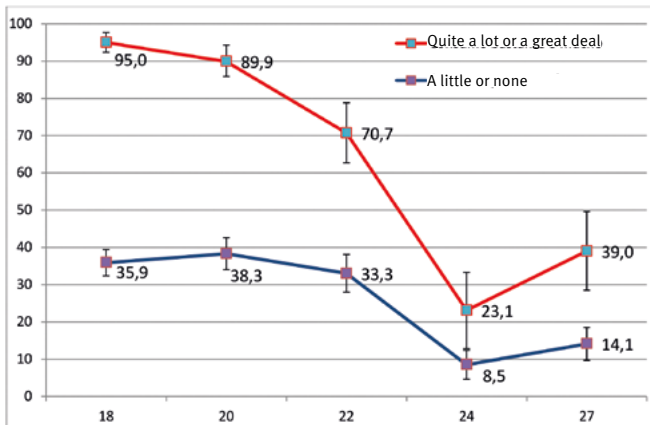


Figure 1. Prevalence (%) of risky alcohol consumption among women at ages 18, 20, 22, 24 and 27 according to the perception of their own consumption at age 18.

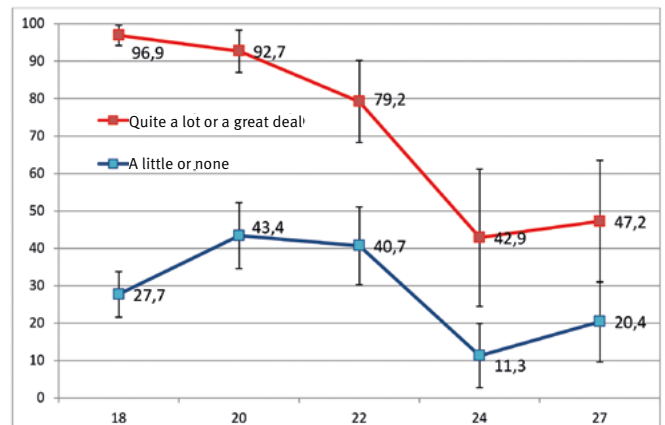


Figure 2. Prevalence (%) of risky alcohol consumption among men at ages 18, 20, 22, 24 and 27 according to the perception of their own consumption at age 18.

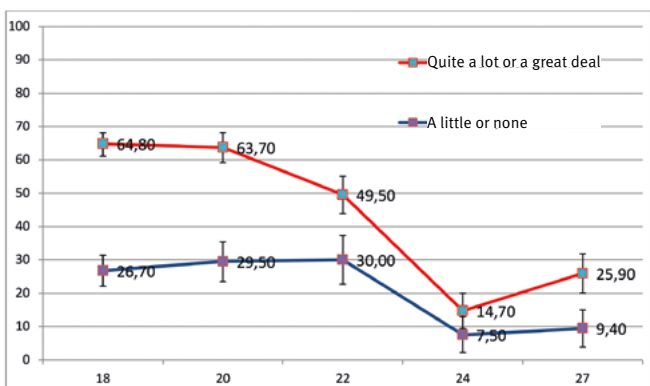


Figure 3. Prevalence (%) of risky alcohol consumption among women at ages 18, 20, 22, 24 and 27 according to their friends' perception of consumption at age 18.

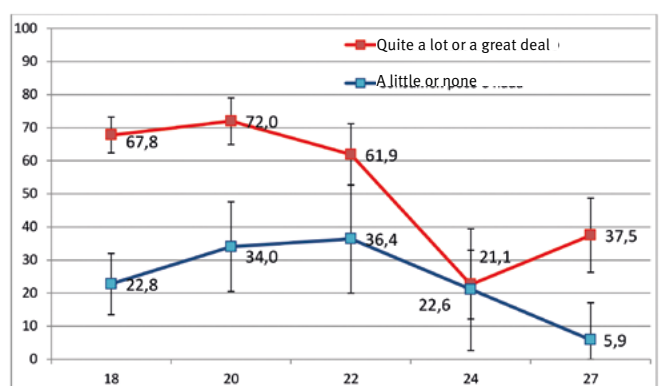


Figure 4. Prevalence (%) of risky alcohol consumption among men at ages 18, 20, 22, 24 and 27 according to their friends' perception of consumption at age 18.

this variable has no effect in the multivariate analysis for RC in men.

It could be argued that a possible limitation of the study is the lack of information regarding the real alcohol use of closest friends and relatives since this information is taken directly from the participants, but previous studies focusing on adolescents and young people have found that their perceptions of drinking by their peers are a better predictor of their alcohol use than the actual consumption of their peers (Deutsch, Chernyavskiy, Steinley & Slutske, 2015; Kenney, Ott, Meisel & Barnett, 2017). In addition, the high prevalence of RC and BD found in the cohort at 18 and 19 years (58.0% and 35.6% in men and 51.5% and 17.9% in women respectively) supports the accuracy of participants' reported perception of their friends' drinking.

Our results show that the perception that siblings drink a great deal of alcohol increases the risk of RC and BD in both sexes. Although the evidence in the literature in this regard is scarce, the results obtained are in line with previous studies showing the alcohol use of older siblings to be an important predictor of drinking among the young (Stormshak, Comeau & Shepard, 2004; Whiteman, Jensen & Maggs, 2013). Siblings are part of the family context dur-

ing a vital period in which the influence of parents appears to decrease as young people interact with each other and become more influenced by their peers (Aseltine, 1995; Voogt et al., 2017). The relationships between siblings are probably more similar to those with peers (Schuler, Tucker, Pedersen & D'Amico, 2019; Serafini & Stewart, 2015); being closer in age, it is possible that they feel more in tune with each other, share more interests and similar important moments. Older siblings can be seen as role models, and their alcohol use, therefore, influences the younger ones. In a study in this regard, Whiteman et al. (2016), after taking into account shared friends between siblings, supported the hypothesis put forward by numerous authors researching the school population regarding the influence of older siblings on the drinking of minors, probably facilitating access to alcohol and even the places to drink it.

No link was found between the perception of parental drinking and BD or RC patterns. This lack of association may partly be due to the low variability of these variables. Our results show that the perception that fathers drink a little or quite a lot of alcohol increases the risk of women's RC, and the perception that mothers consume quite a lot

Table 6. Influence of own consumption and the consumption of those close to them at 18 years of age on risky consumption and binge drinking of female university students aged 18 to 27.

	Odds ratio (95%CI)			
	Risky Consumption		Binge Drinking	
	Bivariate	Multivariate <sup>a</sup>	Bivariate	Multivariate <sup>a</sup>
<b>Perception of friends' alcohol consumption</b>				
None	1	1	1	1
A little	5.7 (2.0 - 16.3)	3.8 (1.3 - 11.4)	3.7 (0.4 - 31.1)	2.2 (0.3 - 17.7)
Quite a lot	18.1 (6.4 - 51.4)	11.2 (3.8 - 32.7)	13.0 (1.6 - 107.4)	6.9 (0.9 - 55.7)
A great deal	30.4 (10.6 - 87.4)	17.5 (5.8 - 52.2)	34.6 (4.2 - 288.2)	19.3 (2.4 - 156.6)
<b>Perception of siblings' alcohol consumption</b>				
None	1	1	1	1
A little	1.2 (1.0 - 1.5)	1.3 (1.3 - 1.6)	1.4 (1.0 - 1.8)	1.1 (0.9 - 1.4)
Quite a lot	3.4 (2.6 - 4.5)	2.9 (2.2-3.8)	2.6 (1.9 - 3.6)	2.7 (2.0 - 3.6)
A great deal	5.0 (2.9 - 8.8)	3.7 (2.0 - 7.0)	5.7 (3.3 - 9.7)	4.5 (2.4 - 8.4)
<b>Perception of mother's alcohol consumption</b>				
None	1		1	
A little	1.0 (0.8 - 1.1)		1.1 (0.9 - 1.4)	
Quite a lot	2.5 (0.9 - 6.8)		0.7 (0.2 - 3.2)	
<b>Perception of father's alcohol consumption</b>				
None	1		1	
A little	1.4 (1.1 - 1.6)		1.1 (0.9 - 1.4)	
Quite a lot	1.9 (1.3 - 2.6)		1.4 (0.9 - 2.2)	
A great deal	0.1 (0.03 - 0.6)		0.3 (0.04 - 2.4)	
<b>Place of residence</b>				
Family home	1	1	1	1
Outside the family home	1.6 (1.3 - 2.0)	1.9 (1.5 - 2.4)	1.6 (1.2 - 2.1)	1.7 (1.2 - 2.3)

Nota.

<sup>a</sup> Adjusted for the other variables included in the column and level of maternal education and age of the participants (period).

of alcohol increases the risk of men's RC, in both cases in the bivariate analysis. Similarly, an association was found in the bivariate analysis of drinking by fathers and mothers and the alcohol use of university students in 3,418 students at seven universities in the state of Georgia (Windle, Haardörfer, Lloyd, Foster & Berg, 2017).

However, the fact that the father drinks a great deal of alcohol acts as a protective factor in women. One possible explanation is that seeing the father drink regularly normalises drinking, but only up to a certain point where the negative effects of this drinking become more evident. This phenomenon has previously been described in the literature and is known as "aversive transmission", consisting precisely in that the more the parents drink, the more their children do the same, but once these amounts reach very high levels, they drop considerably among children, particularly daughters (Harburg, DiFranceisto, Webster, Gleiberman & Schork, 1990). This association disappears when other variables come into play, such as the alcohol use of friends. Windle et al. (2017) explain this as a reflection of reduced parental influence as their children

grow up, which is inversely parallel to the stronger effect on young people's substance use of the attitudes and substance use of the individuals and groups with whom they interact more frequently and in a more intense way (Bahr et al., 2005).

It is of particular interest that the associations between the perception of parental drinking and RC is found in the bivariate analysis, while the perceptions of friends' drinking are associated with BD in both sexes, a more common pattern among young people (Ministerio de Sanidad, 2018b).

The risk of RC and BD in university students increases when living outside the family home, a variable clearly related to the family context and one which maintains its effect in the multivariate analysis. This means that university students living in the family home with the same perception of drinking by friends, father, mother or siblings as those living outside have a lower risk of RC and BD. This variable has previously been shown to influence these drinking patterns in the Compostela 2005 Cohort (Moure-Rodríguez et al., 2016), and we believe it reflects the greater supervi-

Table 7. Influence of own consumption and the consumption of those close to them at 18 years of age on risky consumption and binge drinking of male university students aged 18 to 27.

	Odds ratio (IC 95%)			
	Risk consumption of alcohol		Intensive Alcohol Consumption	
	Bivariate	Multivariate <sup>a</sup>	Bivariate	Multivariate <sup>a</sup>
<b>Perception of friends' alcohol consumption</b>				
None	1		1	1
A little	0.6 (0.2 - 1.9)	¿???	2.8 (0.3 - 25.9)	2.7 (0.3 - 27.4)
Quite a lot	2.1 (0.6 - 6.8)		7.2 (0.8 - 63.2)	7.0 (0.7-67.3)
A great deal	4.1 (1.3 - 13.4)		17.9 (2.0 - 158.8)	17.5 (1.8 - 170.3)
<b>Perception of siblings' alcohol consumption</b>				
None	1	1	1	1
A little	0.9 (0.6 - 1.3)	0.8 (0.6 - 1.2)	1.1 (0.8 - 1.6)	1.1 (0.7 - 1.6)
Quite a lot	1.3 (0.8 - 2.1)	1.2 (0.7 - 1.9)	1.3 (0.8 - 2.1)	1.2 (0.7 - 2.0)
A great deal	11.7 (3.3 - 41.9)	11.6 (3.3 - 40.9)	4.2 (2.0 - 9.1)	2.8 (1.2 - 6.6)
<b>Perception of mother's alcohol consumption</b>				
Does not consume	1		1	
Little consumption	1.0 (0.7 - 1.3)		1.3 (0.7 - 1.4)	
Considerable consumption	8.5 (1.6 - 46.6)		1.8 (0.7 - 5.1)	
<b>Perception of father's alcohol consumption</b>				
None	1		1	
A little	0.9 (0.6 - 1.2)		0.8 (0.6 - 1.2)	
Quite a lot	1.7 (1.0 - 3.1)		0.9 (0.5 - 1.6)	
A great deal	0.8 (0.3 - 2.4)		0.8 (0.3 - 2.4)	
<b>Place of residence</b>				
Family home	1	1	1	1
Outside the family home	1.6 (1.2 - 2.2)	1.6 (1.1 - 2.3)	1.6 (1.1 - 2.2)	1.6 (1.1 - 2.4)

Nota.

<sup>a</sup>Adjusted for the other variables included in the column and level of maternal education and age of the participants (period).

sion or parental monitoring of young people living in the family home. This has also been observed by other authors, and can be seen as a protective factor against alcohol use in young people (Moore, Rothwell & Segrott, 2010). Some authors have reported that greater parental monitoring in the sense of knowing who their sons and daughters mix with or what they do – or simply the greater sense of participation that students feel – acts as a protective factor against drinking, even during the university period (Abar & Turrisi, 2008; Jessor, Costa, Krueger & Turbin, 2006; Wood et al., 2004). Therefore, living with parents during college can reduce the influence of peers regarding alcohol use (White, Fleming, Kim, Catalano & McMorris, 2008). Quinn et al. (2011) carried out a study which compared university students with non-university students, concluding that social group norms affect non-university students less, probably because the former tend to live with their peers and are therefore more influenced by them. Young people who live in the family home will not experience such a closed and ongoing relationship with their peers. In addition, peer pressure on campus will increase the likelihood of BD – peers act as

providers of alcohol, older students can act as role models – so the environment thus helps to make the practice of BD normal and accepted (Borsari & Carey, 2001).

In view of these results, preventive measures should be designed in the future from a contextual perspective, where not only young university students but also their closest circle – friends, siblings – are taken into account. Along these lines, in a review of the scientific literature Lewis and Neighbors (2006) conclude that personalised feedback on peer drinking has been effective in reducing alcohol use and its negative consequences among young people. Our study confirms the importance of the influence of social relationships on these practices among our university students. In addition, living in the family home at the beginning of the university period continues to act as a protective factor, and not only during the first years of university, but during the following 10 years, hence highlighting the influence of the family context, which continues to protect from these risk behaviours even in a society where drinking is highly normalised (Ministerio de Sanidad, Política Social e Igualdad, s.f.).

This study has four main limitations: 1) As in other cohort studies, subjects dropping out during follow up can lead to biases. However, there were no significant differences among participants throughout the study period, suggesting the absence of any such bias; 2) Information bias is always likely in self-report questionnaires. To minimize this bias, the AUDIT, an internationally validated questionnaire among adolescents and young adults, was used; 3) The third question in AUDIT does not differentiate between sexes, which may mean that the prevalence of BD in women is underestimated in this study as it does not take into account women who drink five alcoholic beverages on a single occasion. Nevertheless, this only affects the descriptive analysis and not the analytical results; and 4) the questionnaire on expectations has not been validated and it is thus possible that the expectations regarding alcohol use have not been measured correctly.

## Conclusion

University students perceive that their friends drink much more, and that they themselves drink much more than their relatives. As the perception of alcohol use by those close to them increases, so does the proportion of subjects who practise RC and BD. The risk of practising RC and BD increases in both sexes when university students perceive that their siblings consume large amounts of alcohol. This association is also true regarding the drinking of their friends, except for RC in men, where it is absent. Alcohol use patterns of parents do not affect college student drinking when friends and siblings are taken into account. Finally, living outside the family home increases the risk of both drinking patterns among college and university students. In view of these results, the design of future preventive measures should take into account not only the targeted young people but also the context and those close to them.

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## Conflict of interests

The authors declare no conflict of interest.

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