Psicothema

Psicothema 2020, Vol. 32, No. 2, 189-196
doi: 10.7334/psicothema2019.263

ISSN 0214 - 9915 CODEN PSOTEG

www.psicothema.com

Alcohol consumption in adolescents: The predictive role of drinking motives

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Abstract

Background: Several studies have shown differences in the motivational processes that lead to excessive alcohol consumption among adolescents. The paper focuses on the analysis of the reasons for alcohol consumption among minors, and compare the differences according to sex, age, and level of consumption. **Method:** A representative sample (N = 2,865) of adolescents aged 12 to 18 years (mean age 14.24, dt = 1.33) was collected. The variables abuse, binge drinking and drinking motives were evaluated using a questionnaire designed ad hoc, which identified the Cooper's four categories of motives. **Results:** The analyses (ANOVA, Pearson correlation, and logistic regression) showed that there were no differences between young men and women regarding consumption or binge drinking. Minors who abused alcohol experience consumption as pleasurable in itself, as an important source of intrinsic reinforcement. Conformity predicted the problematic consumption of alcohol among boys and a decrease in the frequency of binge drinking among girls. In addition, the larger group showed more presence of enhancement and social motives. **Conclusions:** This study suggests that it would not be of interest to focus prevention on the negative consequences of consumption, but rather on the training of specific skills.

Keywords: drinking motives, adolescent consumption, binge drinking, alcohol abuse.

Resumen

Consumo de alcohol en adolescentes: el papel predictor de los motivos de consumo. **Antecedentes:** varios estudios han mostrado diferencias en los procesos motivacionales que llevan al consumo excesivo de alcohol en adolescentes. El objetivo del trabajo fue analizar los motivos de consumo de alcohol en menores y sus diferencias según el género, la edad o el grado de consumo. **Método:** se recogió una muestra representativa (N = 2865) de adolescentes de 12 a 18 años (edad media 14,24, dt=1.33). Se evaluaron las variables consumo problemático, binge drinking y motivos de consumo mediante un cuestionario diseñado ad hoc, que identificaba las cuatro categorías de motivos de Cooper. **Resultados:** los análisis (ANOVA, correlación de Pearson y regresión logística) mostraron que no hubo diferencias de género en consumo ni en binge drinking. Los menores que abusaban del alcohol informaron de más presencia de reforzadores de todo tipo, siendo el consumo una fuente importante de reforzamiento intrínseco. La conformidad predijo el consumo problemático del alcohol en varones y disminuyó la frecuencia del binge drinking en chicas; además, el grupo mayor mostró más presencia de los motivos de bienestar y sociales. **Conclusiones:** el estudio sugiere que no sería de interés centrar la prevención en las consecuencias negativas del consumo, sino en el entrenamiento de habilidades concretas.

Palabras clave: motivos de consumo, consumo adolescente, *binge drinking*, abuso de alcohol.

Excessive alcohol consumption during adolescence represents a concern due to its numerous negative consequences –difficulty in emotional regulation, increased risky sexual behaviors, fighting and physical aggression, neurotoxic effects on memory, attention and learning, and changes in brain structures and their functionality (Bajac, Feliu-Soler, Meerhoff, Latorre, & Elices, 2016). One type of excessive consumption is so called "binge drinking" (BD), which is usually defined as the consumption of 5 or more units of alcoholic beverages in an approximate interval of two hours (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Although the practice of BD among university students has been abundantly documented, it also occurs among children and minor adolescents. For example, in Spain, 1 out of 3 students aged 14-18 years acknowledged having engaged in this type of consumption during the last 30 days (Spanish Observatory on Drugs, 2018). The differences between adult men and women regarding alcohol consumption and abuse, documented in numerous studies (Schulte, Ramo, & Brown, 2009) do not seem to be so clearly found in adolescents. During pre-adolescence (around age 11) differences are barely perceptible and increase with age (Goldstein, Wall, Wekerte, & Krank, 2013; Kuntsche et al., 2015).

Various theoretical models have been developed for the understanding, explanation, and prediction of excessive alcohol consumption among minors. Some of these models focus on the consequences of consumption, based on the assumption that a behavior, such as adolescent alcohol consumption behavior, is maintained if it is being reinforced by positive reinforcement

Received: September 2, 2019 • Accepted: November 12, 2020
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processes (the behavior achieves a positive reinforcing stimulus) or by negative reinforcement (the behavior achieves the avoidance or escape of a negative reinforcing stimulus). These concepts, specifically applied to alcohol consumption of adolescents and young people, have been included in the theory of behavioral choice (Behavioral Choice Theory, BCT) or the theory of behavioral economics, developed by Vuchinich and colleagues (see review in Goldstein et al., 2013, or in Hallgren, Greenfield, & Ladd, 2016).

The *Theory of behavioral choice* indicates that the preference for reinforcing behavior depends on the availability of other possible reinforcing activities, with the increase in alcohol use being more frequent in contexts where 1) there is little difficulty in accessing it, and 2) there is great difficulty in accessing reinforcing activities that do not involve the use of alcohol or other substances. However, not all possible alternative activities serve as substitutes for alcohol consumption - some are associated with high consumption ("complementary behaviors") because they are perceived as more reinforcing when there is alcohol, and others are usually associated consistently with low consumption ("substitute behaviors") because it is perceived that alcohol consumption would reduce the reinforcing value of such behavior. The study by Goldstein et al. (2013) found that, in children aged between 11 and 16, social behaviors (going out with friends or partying) would be an example of complementary behavior; conversely, spending time with the family or on hobbies would be substitute activities, whose reinforcing power would be reduced by drinking.

As we can see, BCT focuses on the *amount* of reinforcement perceived by the adolescent, but it does not distinguish the *type of reinforcement* produced (positive or negative), nor does it attempt to distinguish which specifically are the reinforcers or *drinking motives* (DM). However, it would be very interesting to examine these reasons further. Based on the work of other authors, Cooper (1994) proposed a classification for DMs by *type of reinforcement* (positive or negative) and by *type of reinforcers* obtained with alcohol (internal or external). Based on these distinctions, motives can be classified into four distinct categories: enhancement (positive reinforcement and internal reinforcers, for example, drinking to have fun), coping (negative reinforcement and internal reinforcers, for example, drinking to forget problems), social (positive reinforcement and external reinforcers, for example, drinking to be sociable) and conformity (negative reinforcement and external reinforcers, for example, drinking to fit into a group).

Some studies have shown how interesting this classification is by examining the role of the different DMs in adolescent alcohol use (Kuntsche et al., 2015).

Regarding sex differences in adolescent DMs, the results from the different studies are contradictory. While some studies show that young women more frequently report coping motives (Cooper, 1994; De la Villa, Rodríguez, & Sirvent, 2005; Kuntsche et al., 2015), others do not find differences in DM between girls and boys (Anderson, Grunwald, Bekman, Brown, & Grant, 2011; Bradizza, Reifman, & Barnes, 1999; Comesco, Berglund, Oreland, & Nilsson, 2010). Graziano, Bina, Giannotta, and Ciairano (2012) only find differences in conformity motives (greater in boys), and other studies find more reasons of all types in boys than in girls (Simoes, Branquinho, Santos, & Gaspar, 2018; Willem, Bijttebier, Claes, & Uytterhaegen, 2012). There is, thus, a need to continue researching this aspect.

With respect to differences in DMs according to age, coping motives seem to be more present in older adolescents (Bradizza et al., 1990; Graziano et al., 2012) and those of conformity among the youngest (Graziano et al., 2012), with differences between girls and boys being more marked among older adolescents (Kuntsche et al., 2015).

In Spain, there have been few studies applying Cooper's motivational model to the study of DMs in adolescents or analysing sex differences in motives for teenage drinking.

The aim of this study is to analyse the motives for alcohol use in young people aged between 12 and 18, and to examine whether different drinking motives exist depending on sex, age or degree of use (problematic drinking, binge drinking and controlled drinking). We expect to find differences in DMs among adolescents who drink in a controlled and problematic way, and, consistent with the literature, it is expected that differences in these motives will be found by sex and age, with the most marked sex differences in older adolescents.

Method

Participants

Simple random sampling was carried out, with a 2.5% sampling error, 95% confidence, and 50% population variance. First, schools were sampled and the information regarding all secondary education classes corresponding to each randomly selected school was subsequently gathered.

The resulting representative sample (N = 2865) consisted of adolescents from the Community of Madrid, Spain, attending the four compulsory years of secondary education in ten schools. Girls made up 47.4% and boys 52.6% of the sample. The average age was 14.24 years (SD = 1.33) in a range from 12 to 18 years (there were only 27 participants, 9%, aged 18).

Of the 2865 participants, 1681 reported having drunk alcohol at some time in their lives (58.7%, 95% CI [56.3% - 61.0%]), and of these, 1208 said they had drunk in the previous year, representing 42.2% [39.4 - 44.9] of the total sample. Of these, 395 minors were classified in the Problem Drinking group, PD, (13.8% [10.4 - 17.2] of the total sample) and 813 in the Controlled Drinking group, CD, (28.4% [25.3 - 31.5]). Figure 1 details the sample shaping procedure.

Table 1 describes the distribution of groups by sex and age, grouping participants in three age groups following Kuntsche et al. (2015).

Instruments

To design the research instruments and ensure their ecological validity and their suitability to the specific context of the participants, a preliminary exploratory study based on seven discussion groups with adolescents was initially carried out (along the lines of the study by Graziano et al., 2012). Based on the results of these groups and a review of the literature, the items making up the following measures were chosen and drafted.

Problem Drinking (PD) was assessed using eight items with a dichotomous response format, Yes or No. The items were drawn up specifically for this study, reflecting indicators used in other studies on alcohol abuse in adolescents (e.g. Anderson et al., 2011; Bradizza et al., 1999). An affirmative answer to any of the items meant automatic classification of the participant in the PD group. A sample item is: *"Has alcohol been a problem in your life?"*. The instrument used in the study is detailed in Appendix 1.

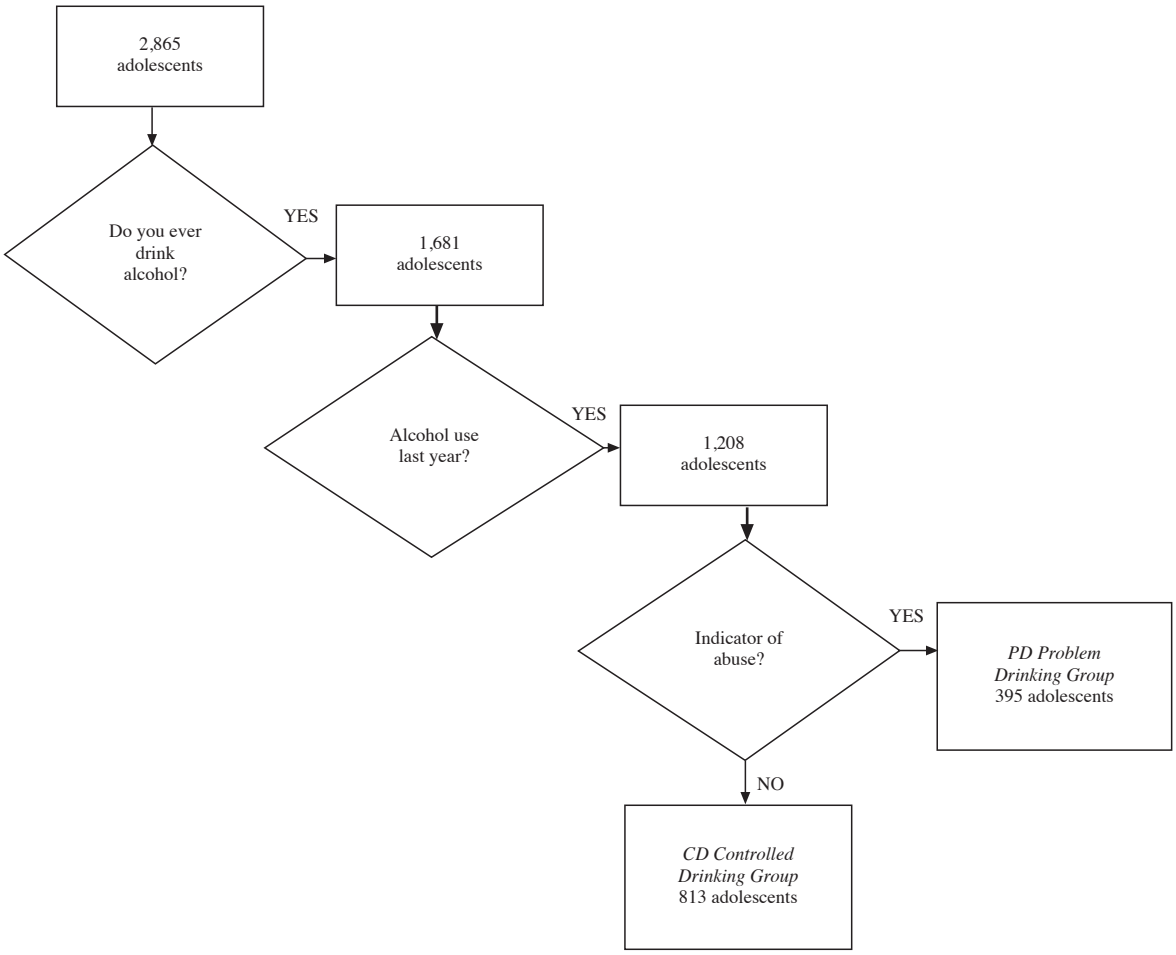

Figure 1. Breakdown of study sample

Table 1
Sample distribution by sex and age groups

Group	Sex	Age			Total
		12-13 years	14-16 years	17-18 years	
Controlled drinking	Girls	93	271	11	375
	Boys	139	281	18	438
Problem drinking	Girls	7	165	23	195
	Boys	10	166	24	200
Total		249	883	76	1208

Binge Drinking was measured by the item: *"Do you ever have 5 or more drinks of alcohol in approximately two hours?"* with a yes/no response option. In Spain, a Standard Drinks Unit (SDU) is equivalent to 10 g of alcohol (Rodríguez-Martos, Gual, & Llopis, 1999).

Drinking motives were evaluated using an instrument designed specifically for our investigation (Appendix 1). The question: *When you have alcoholic drinks, what are the most frequent reasons for doing so?* was followed by 12 items scored on a scale from 0 to 3, with 0: "Never" and 3: "Many times." The items include motives from Cooper's classification (1994), the study by Comesco et al. (2010), and those obtained in the discussion groups, and were classified under: enhancement (an example of an item is *"because I like alcohol"*), coping (for example, *"to forget everything"),* social (for example, *"because it helps me relate better"*) and conformity (example *"because others expect me to do it"*). This measure yielded a Cronbach's alpha of .843.

Procedure

After the project was approved by the Ethics Committee of the University, the schools were contacted, and they then authorised the use of the questionnaire. The questionnaire was self-administered in the classroom in the presence of the interviewer.

Data analysis

Drinking motives were compared by sex and whether or not problem drinking was involved using a 2x2 ANOVA. Additionally, the relationship of age with each of the motives was assessed by Pearson correlation. Finally, a stepwise logistic regression model was fitted to try to predict the risk of PD in people who use alcohol and do BD on the basis of the four motives, sex and age. Variables with an associated value of $F < 0.1$ were retained. The final model was presented reporting the percentage of success in the classification and the Nagelkerke r^2 statistic. Predictions deviated

Appendix 1
Instrument for assessing study variables

Indicators of Problem Consumption	**RESPONSE**	
Do you ever have 5 or more drinks of alcohol in approximately two hours?	YES	NO
Would you like to reduce your alcohol consumption?	YES	NO
In the last year, have you consumed more alcohol than you intended, or than you would have liked to consume?	YES	NO
In the last year, have you consumed increasing amounts to catch a "buzz"?	YES	NO
In the last year, have you become worried about your alcohol consumption?	YES	NO
In the last year, have you made any attempt to reduce consumption?	YES	NO
In the last year, has alcohol been a problem in your life?	YES	NO
In the last year, have you had any withdrawal symptoms when you have not consumed?	YES	NO

Drinking motives	**Never**	**Sometimes**	**Several times**	**Many times**
Enhancement				
To get drunk	0	1	2	3
To catch a "buzz"	0	1	2	3
Because I like alcohol	0	1	2	3
Because I have fun when I drink	0	1	2	3
Coping				
To disinhibit me	0	1	2	3
To forget everything	0	1	2	3
Because if not, I'm bored	0	1	2	3
Social				
Because it helps me relate better	0	1	2	3
To celebrate an event	0	1	2	3
To be able to do things that I would not do without alcohol	0	1	2	3
Regarding conformity				
Because everybody does it	0	1	2	3
Because others expect me to do it	0	1	2	3

from the data in the Hosmer and Lemeshow test. All analyses were performed with IBM SPSS Statistics V.24.0.

Results

The study is part of a larger investigation, and the complete questionnaire included more questions than those mentioned in the instruments section. The questionnaire submitted was rather long and, given that some sections were only answered depending on the response to previous questions, many participants were confused and did not answer some questions. In particular, of the 813 participants in the Controlled Drinking (CD) group, only 297 answered questions about the reasons for drinking. Although it is a significant loss, the group is still large and similar in size to the PD group, so the results of the following analyses were not affected.

No sex differences were found in CD, PD or BD. Problem drinking was reported by 34.2% of girls (195 of 570) and 31.35% of boys (200 of 638), $X^2 = 1.21; p = .290$. In the controlled drinking group, 45.5% of the girls (109 of 240) and 51.0% of the boys (131 of 257) reported having done binge drinking at some point, $X^2 = 1.53; p = .215$. BD was reported by 54.9% of the girls and 64% of the boys in the PD group.

Drinking motives and sex

Among those giving *enhancement* as a motive, no sex effect was found, $F(1, 651) = 0.22; p = .641$, nor was there any interaction between PD and sex, $F(1, 651) = 0.20; p = .658$. However, there was a PD effect, $F(1, 651) = 149.57; p < .001; \eta^2 = .187$. That is, children who showed PD reported a greater presence of these reinforcers (Table 2) than those with controlled drinking. Similar results were found in the case of BD: no sex effect $F(1, 456) = 3.41; p = .066$, nor interaction effect between both factors, $F(1, 456) = 0.87; p = .352;$ and those who had done BD, both boys and girls, reported greater presence of *enhancement* reinforcers, $F(1, 456) = 52.75; p < .001; \eta^2 = .104$.

Similarly, there was no interaction between PD and sex in *coping* motives, $F(1, 645) = 0.45; p = .503$, nor sex effect, $F(1, 645) = 0.69; p = .406$. However, a PD effect was found, $F(1, 645) = 60.91; p < .001; \eta^2 = .086$. That is, those who showed PD reported a greater presence of these motives than those who drank in a controlled manner. A similar result was found when analysing BD, with those practising BD showing greater prevalence of coping reinforcers, $F(1, 453) = 42.68; p < .001; \eta^2 = .086$. A sex effect was not found, $F(1, 453) = 3.68; p = .056$, although the result was close to statistical significance in this case, nor was there interaction between both factors, $F(1, 453) = 0.45; p = .502$.

When analysing the *social* motives for drinking, again only one PD effect was found, $F(1, 669) = 64{,}29; p < .001; \eta^2 = .088$, but no sex effect, $F(1, 669) = 0.50; p = .479$, nor interaction between PD and sex, $F(1, 669) = 0.05; p = .831$. This implies that people with PD reported a greater presence of these motives than those who drank in a controlled manner. Similarly, those who practised BD showed a greater presence of social motives, $F(1, 469) =$

39.67; p < .001; η^2 = .078. There was no effect of sex, *F(1, 469) = 2.64; p = .105*, nor of interaction between both factors, *F(1, 469) = 1.78; p = .182*.

When analysing *conformity* motives, an interaction between PD and sex was found, *F(1, 671) = 8.34; p = .004; η^2 = .012*. Girls who did not show PD reported greater presence of these types of motives than those with PD; however, boys who showed PD reported more conformity motives than those who drank in a controlled manner. A similar result was found in BD with a significant interaction, *F(1, 469) = 3.74; p = .054; η^2 = .008* (Table 3).

Age and drinking motives

People who showed PD (n = 395; 15.31 ± 1.09) were older than those who with controlled drinking (n = 813; 14.32 ± 1.31), *t(920.7) = 13.81; p < 001*. However, we found no differences in the average age of participants who had done BD (n = 240; 15.40 ± 1.06) and those who had not (n = 257; 15.24 ± 1.08), *t(495) = 1.61; p = .108*.

On the other hand, with increasing age *enhancement* became more a more prevalent reason, *n = 655; r = .257; p < .001*, as did coping, *n = 649; r = .137; p < .001*, and social, *n = 673; r = .244; p < .001*, although not conformity, *n = 675; r = -.054; p = .159*.

Age and gender

In *enhancement*, there was no interaction between sex and age group, *F(2, 649) = 0.236; p = .790*, nor sex effect, *F(1, 649) = 0.113; p = .737*; however, an age effect was found, *F(2, 649) = 17.67; p < .001; η^2 = .052*, with greater prevalence of these motives as age increases (Table 4).

In terms of reinforcers for the social motive, no interaction was found between sex and age group, *F(2, 667) = 0.441; p = .643*, nor sex effect, *F(1, 667) = 1.609; p = .205*; an age group effect, however, did appear, *F(2, 667) = 11.73; p < .001; η^2 = .034*. Again, the older the participant, the more frequently this reason was given.

Table 2
Average scores for drinking motives according to sex and type of consumption

		Enhancement		Coping		Social		Conformity	
		n	M (SD)	n	M (SD)	n	M (SD)	n	M (SD)
Controlled drinking	Women	134	0.70 (0.64)	134	0.26 (0.46)	139	1.11 (0.58)	140	0.19 (0.37)
	Men	154	0.70 (0.60)	150	0.25 (0.43)	155	1.08 (0.67)	157	0.13 (0.33)
Problem drinking	Women	182	1.44 (0.80)	181	0.64 (0.63)	190	1.54 (0.70)	189	0.14 (0.29)
	Men	185	1.38 (0.84)	184	0.57 (0.69)	189	1.49 (0.71)	189	0.26 (0.55)

The scores of each variable have a maximum range of 0-4 for enhancement, 0-3 for coping and social, and 0-2 for conformity

Table 3
Average scores for drinking motives according to sex and presence of Binge Drinking

		Enhancement		Coping		Social		Conformity	
		n	M (SD)	n	M (SD)	n	M (SD)	n	M (SD)
BD no	Women	121	1.14 (0.75)	120	0.44 (0.55)	125	1.35 (0.63)	126	0.21 (0.36)
	Men	115	0.94 (0.73)	114	0.29 (0.46)	117	1.17 (0.61)	117	0.20 (0.43)
BD yes	Women	102	1.61 (0.81)	102	0.77 (0.68)	107	1.66 (0.73)	106	0.11 (0.27)
	Men	122	1.54 (0.84)	121	0.70 (0.73)	124	1.64 (0.73)	124	0.25 (0.56)

Note: BD = Binge Drinking
The scores of each variable have a maximum range of 0-4 for enhancement, 0-3 for coping and social, and 0-2 for conformity

Table 4
Average scores for drinking motives according to sex and age

		Enhancement		Coping		Social		Conformity	
		n	M (SD)	n	M (SD)	n	M (SD)	n	M (SD)
12-13 years	Women	17	0.53 (0.58)	17	0.22 (0.31)	18	1.06 (0.51)	18	0.11 (0.21)
	Men	23	0.4 (0.45)	22	0.32 (0.58)	23	0.9 (0.61)	23	0.20 (0.39)
14-16 years	Women	71	1.13 (0.80)	268	0.48 (0.58)	281	1.33 (0.68)	282	0.17 (0.34)
	Men	280	1.08 (0.82)	276	0.43 (0.62)	284	1.31 (0.71)	286	0.22 (0.49)
17-18 years	Women	28	1.39 (0.96)	30	0.63 (0.76)	30	1.72 (0.66)	29	0.07 (0.22)
	Men	36	1.47 (0.74)	36	0.44 (0.56)	37	1.55 (0.76)	37	0.09 (0.31)

The scores of each variable have a maximum range of 0-4 for enhancement motives, 0-3 for coping and social and 0-2 for compliance

For coping, no interaction was found between sex and age group, $F(2, 643) = 0.756; p = .470$, neither was there an effect of sex, $F(1, 643) = 0.268; p = .605$, nor of age group, $F(2, 643) = 2.517; p = .081$. At the descriptive level, however, there was a tendency for these motives to increase with age.

Regarding conformity, there was no interaction between sex and age group, $F(1, 669) = 0.067; p = .935$, neither was there a sex effect, $F(1, 669) = 0.147; p = .342$, nor an age effect, $F(2, 669) = 2.425; p = .089$. At the descriptive level it could be observed that these motives became less frequent in the older age group.

Predictive model

The predictive model for PD retained the enhancement, social and coping motives, and yielded a significant improvement in prediction compared to the null model, $X^2(3) = 160,86; p < .001; r^2 = .265$, correctly classifying 68.9% of participants who did not show PD and 71.9% of participants who did. In addition, the Hosmer and Lemeshow fit test did not yield significant differences between the observed frequencies and those predicted by the model, $X^2(8) = 8.64; p = .374$. The model shows that enhancement, social and coping reinforcers positively predict PD, with greater weight on enhancement (Table 5).

The predictive model for BD retained all four types of reason and sex, showing a significant improvement in prediction with respect to the null model, $X^2(3) = 160,86; p < .001; r^2 = .265$, correctly classifying 72.5% of the participants who had not tried BD and 64.8% of those who had. In addition, the Hosmer and Lemeshow fit test did not produce significant differences between the observed frequencies and those predicted by the model, $X^2(8) = 6.01; p = .646$. The model shows that enhancement, sociability and coping, as well as being male, positively predict the practice of BD, and conformity negatively predicts BD in girls.

Discussion

The aim of the study was to discover the different drinking motives given by Spanish adolescents with controlled and problematic drinking, and analyse possible differences in these motives between young women and men by age group.

We expected to find differences in sex, especially in the older age group, along the lines indicated by different authors (Cooper, 1994; Goldstein et al., 2013; Kuntsche et al., 2015), but we did not find them in CD, PD or BD. In different countries, there is a reduction in sex differences, with adolescent alcohol consumption patterns becoming more balanced (De la Villa et al., 2005; Pitel, Geckova, van Dijk, & Reijneveld, 2010; Schulte et al., 2009). Our data supports this levelling off, even in the oldest group, although given that in our sample this group was under-represented (only 76 of the 1,208 participants who drank alcohol in the previous year), more studies would be necessary.

Table 5
Predictive model of Problem Drinking and Binge Drinking

Problem drinking	**B**	**SE**	**p**	**L(B)**
Enhancement	1.087	0,159	< .001	2.967
Social	0.535	0,157	.001	1.708
Coping	0.472	0,219	.031	1.603
Constant	-1.693	0,221	< .001	0.184
Binge drinking	**B**	**SE**	**p**	**L(B)**
Enhancement	0.601	0,158	< .001	1.824
Social	0.501	0,175	.004	0.651
Coping	0.671	0,214	.002	0.957
Conformity	-0.736	0,275	.007	0.479
Girl	-0.511	0,216	.018	0.600
Constant	-1.506	0,290	< .001	0.222

The PD and BD groups report greater reinforcement from alcohol, not only regarding group pressure or problem management processes, but also positive reinforcement (enhancement and social). Other studies have found that social motives better predict alcohol use (in terms of frequency), and that they strongly correlate with enhancement (Mezquita et al., 2016); according to our model, the best predictor of PD is enhancement, in line with other studies (Graziano et al., 2012; Lac & Donaldson, 2017; Willem et al., 2012).

The importance of positive reinforcement is thus confirmed; alcohol not only serves to achieve certain external consequences (to disinhibit or relate better), but is an important source of intrinsic reinforcement. It has been suggested that those who abuse alcohol are more sensitive to reinforcement, both because of a different functioning at the brain level (Robert & Schumann, 2017), and by showing greater behavioural disinhibition. Loxton & Dawe (2001), following the model of the motivational systems proposed by Gray (Behavioural Approach System -BAS- and Behavioural Inhibition System -BIS-), suggest that those who engage in risky behaviours, such as excessive drinking, would be more sensitive to reinforcement (BAS); that is, they would find the pleasurable effects of alcohol more reinforcing than non-problem drinkers, which confirms the study by Willem et al. (2012). Our results would support this hypothesis.

Not only are there differences in the amount of reinforcement between the CD and PD groups, but also in the role that alcohol plays in both cases. Some studies have indicated that motives of conformity make drinking large quantities and drunkenness less likely (Graziano et al., 2012). According to our data, DMs have different roles in PD depending on sex: conformity leads girls to drink in a controlled manner and to avoid BD, while in the case of boys, those with PD and BD more often gave conformity motives than those in the CD group. Other studies have also shown that conformity was more predictive among men (Cooper, 1994) and coping in women (Kuntsche et al., 2015). Although we did not find a direct effect of sex in any of the DMs in our study, our data do indicate greater prevalence of coping as a reason among girls (especially older women). Finally, Kuntsche et al. showed that boys receive more positive reinforcement (enhancement and sociability) than girls. Our results do not indicate this; in addition to not finding significant differences, we found greater presence of social motives in girls of all age groups, especially in the older group.

Minors with PD are older than those who with controlled drinking, consistent with the increase in alcohol problems over time. Nevertheless, no age differences were found among those who do BD. Some previous studies, however, do show an increase in BD with age (Caballero, Fernández, Muñoz, & Carrera, 2014). One explanation could be the smaller number of older participants in our study, or perhaps the difference in the sample sizes of the different studies. We would have to confirm our results before

considering a third possibility more strongly: that BD is beginning to appear in any age range, without being a characteristic of any particular group.

We also found differences in DMs by age. Again, conformity motives behaved differently: they seem especially important between the ages of 14 and 16, becoming less relevant in the older age group (although the differences were not significant). These results are similar to those of Cooper (1994) and Kuntsche et al. (2015); conformity would thus be more predictive of drinking among the youngest.

Positive reinforcement is especially relevant in the oldest group. Some studies found coping motives to be more prevalent among older participants (Bradizza et al., 1999; Graziano et al., 2012). However, in line with our results, Caballero et al. (2014) also found that extrinsic motivation for BD ("to attract attention") decreased with age and that older people reported intrinsic motivation ("enjoyment") as the main reason for this behaviour. It seems clear, therefore, that DMs change with age: those related to positive reinforcement and problem management increase, while social pressure, fundamental when drinking starts at an early age, decreases in importance.

Despite its representative sample, this study has some limitations. For example, social desirability was not controlled for, except in the instructions, so we have no data on the distortion in participant responses. In addition, as explained above, the confusion in understanding the instructions led to a significant reduction of responses in some variables.

Nevertheless, this study can guide interventions aimed at preventing teenage drinking. Traditionally, interventions implemented at school provide information on the negative consequences of the misuse of alcohol. However, the efficacy of these interventions has been questioned (Bajac et al., 2016). Our results suggest that it may not be interesting to focus the intervention on negative consequences in the medium and long term since possible future punishments do not have sufficient aversive power to compete with the numerous immediate reinforcing processes that drinking produces. Our study identifies specific variables on which to work: for example, in the case of boys, given the importance of conformity as a reason for drinking, it is probably more useful to train skills such as assertiveness to help to resist peer pressure. With girls, given that sociability and coping motives seem to drive their PD, it could be interesting to teach other ways of relating successfully with their peers, both favouring the creation of social networks with peers who do not drink, such as training in social and assertive skills, and encouraging reinforcing activities that do not involve the use of alcohol. In addition, training in problem-solving and coping strategies appropriate to the problems they usually face at these ages would also be helpful.

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