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Moderating role of family and friends' factors between disocial behavior and consumption in adolescents

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KEYWORDS

Adolescence;
Dissocial behavior;
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Ex post facto study

Abstract This study analyzes the relation between dissocial behaviors and substances consumption in adolescents, and tests the moderating role of social risk factors from family and peers in this relation. 1,239 adolescents of Secondary school, 612 boys and 627 girls, from 11-18 ($M = 14.39$; $SD = 1.43$) from state and private schools completed an adapted questionnaire from the State survey on risk activities for health in adolescents (ESTUDES) and the FRIDA questionnaire about social risk factors. We found that disocial behaviors and consumption are common and are closely related. MHMR analysis confirm the moderate role of two risk family factors (indifference family reaction against drugs consumption and a permissive and tolerant parental educative style) besides tolerant attitude towards consumption on friends and easily access to drugs. That moderation is higher for girls than for boys. The results of this work highlight the influence of family and friends' factors between dissocial behaviors and drug consumption and contribute to the knowledge of an operational model for the development of preventing programs.

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PALABRAS CLAVE

Adolescencia;
Conductas disociales;
Consumo de drogas;
Riesgo social;
Estudio ex post facto

Resumen Este estudio analiza la relación entre conductas disociales y consumo de sustancias adictivas, y plantea el papel moderador en esta relación de determinados factores de riesgo del entorno familiar y de los amigos. Sobre una muestra de 1.239 adolescentes de Educación Secundaria, 612 chicos y 627 chicas, de 11-18 años ($M = 14,39$; $DT = 1,43$) se aplicó una adaptación de la encuesta estatal ESTUDES que evalúa acciones de riesgo para la salud en adolescentes y el cuestionario FRIDA sobre factores de riesgo social. Encontramos que las conductas disociales y de consumo son frecuentes, y están muy relacionadas. Los resultados de los análisis MHMR confirman el papel moderador de dos factores de riesgo familiar (reacción indiferente ante el consumo de drogas y los estilos educativos democráticos) junto a la actitud tolerante ante el consumo de los amigos y la facilidad de acceso a las drogas. Esta moderación es mayor entre las chicas comparadas con los chicos. El estudio destaca el valor de la influencia de factores famil-

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iares y de los amigos en las conductas disociales y de consumo de los adolescentes, y contribuye al conocimiento de un modelo operacional que facilite el desarrollo de programas preventivos.
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Dissocial behaviors and the use of substances in youth have a significant impact on the overall Spain society. Recent studies show that, among adolescents from 14-18, about 23% regularly consume alcohol at weekends; 20% cannabis; 9.4% take tranquilizers without medical prescription and 9.5% drive under the effect of alcohol (Delegación del Gobierno para el Plan Nacional sobre Drogas [DGPNSD], 2011). In other hand, the Media frequently inform about adolescent criminal acts. Those pre-criminal behaviors are, in their entirety, related to an early beginning in drugs consumption, commitment of rash and dangerous acts (Estevez & Emler, 2011; Farrington, 2005; Gervilla, Cajal, & Plamer, 2011).

American Psychiatric Association (APA) indicates (2000), that Dissocial Behavior (CAS) is the proper term for these deviance behaviors during infancy and adolescence and include being involved in physical fights, harming others or their properties, dishonest behaviors, thieving and seriously offending other social norms. Some studies related a high relation between dissocial behavior and drug consumption and point out that they are good predictors for violence in adolescents (Estevez & Emler, 2011). So that, young people involved in aggression-victimization dynamics consume more alcohol, cigarettes and marijuana than non involved (Carlyle & Steinman, 2007). This is especially significant among secondary school pupils (Radliff, Wheaton, Robinson, & Morris, 2012).

The problem of CAS and consumption in adolescents must be understood as a multi-faced problem where the social contexts take an important role. Researches with youth show the association of social networks with deviance behaviors (Pérez & Gázquez, 2010; Thurnherr, Berchtold, Michaud, Akre, & Suris, 2008) and with substance use (Alfonso, Bueno-Medina, & Espada, 2009; Delegación del Gobierno para el Plan Nacional sobre Drogas [DGPNSD], 2011; Mason, Mennis, & Schmidt, 2011).

Some studies settle in family the mayor part of the origins of antisocial behavior. Farrington (2005) points out that poor parental supervision, punitive or erratic parental discipline, cold attitude, parental conflict and antisocial parents as ones of the main risk factors for antisocial behavior in youth. Spanish studies point as family risk factors, ineffective parenting style, low supervision or control, high levels of conflict, low emotional support, erratic discipline and antisocial parents (Aguilar-Cárceles, 2012; Justicia et al., 2006). Family may influence the likelihood of using drugs, acting as a preventing factor when drugs consumption is not accepted and as a risk factor when it is permitted (Alfonso et al., 2009; Becoña et al., 2012). Interpersonal relationships among family members are good indicators as protective or risk factors (Moreno, Estévez, Murgui, & Musitu, 2009).

More studies about Socialization Family Styles point out that the authoritative style, is related to low legal drugs consumption, whilst the neglectful style increase the risk of drug use (Becoña et al., 2012), but some studies show that this depending on the type of drug (Alfonso et al., 2009). Researches on the authoritarian and permissive styles are also inconclusive (Becoña et al., 2012). Investigations indicate that these negligent or authoritarian parental socialization styles facilitate, not only deviance behavior in children (Farrington, 2005), but also the likelihood of using drugs (Bradshaw, Glaser, Calhoun, & Bates, 2006; Estevez & Emler, 2011; Jiménez, Musitu, & Murgui, 2008). Moreover, some studies find gender differences related to adolescents' adaptation and socialization tasks. Boys found mothers more protective, while girls found more parental control (Muñoz & Garcés de los Fayos, 2009).

Risk factors related to school context are associated to peers group (Justicia et al., 2006; Peña, Andreu, & Graña, 2009). Peers' group can act as a favored space for risk behaviors and consumption among adolescents (Cerezo & Méndez, 2012; Radliff et al., 2012). Studies on the influence of friends for CAS in adolescents enhance their predictive value even more than family (Gervilla et al., 2011), and also for consume (Alfonso et al., 2009; Inglés et al., 2007).

Despite the growing literature on CAS and Consume in adolescents, we do not know yet the moderator role of family and friends risk factors in antisocial behavior and consumption in adolescents and we assume that this knowledge is essential for contextualizing the situation and so to prevent the development of antisocial behavior and drug use.

As well as knowing the incidence of CAS and consumption in adolescents, the purpose of the current study is to analyze the moderating role of different family and friends' risk factors between CAS and consume. We hypothesize that family and friends' support will have direct effects on CAS and consumption risk behaviors (Figure 1). High support from family and friends, opposed to low family and friends' support, is expected to be a powerful resource for enhancing or decreasing the risk effect of CAS and consumption, and this will be different by gender. Elucidating knowledge about the interactive effects of family and friends' support could offer insights into refining approaches to deviance behaviors prevention programs by incorporating and strengthening the joint effects of social factors.

Reduced support is hypothesized to attenuate the effects of CAS on Consume risk; increased support is hypothesized to strengthen the relationship between CAS and consume risk behaviors.

This study was prepared according to considerations of Hartley (2012).

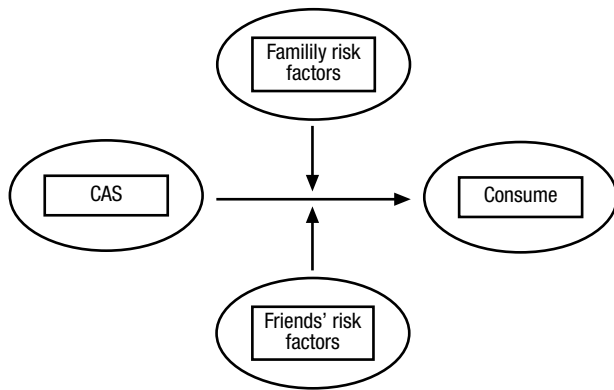


Figure 1 Hypothesized Interaction effects of family and friends risk factors on CAS and consume risk behaviors.

Method

Participants

The study was carried out with a representative sample of secondary pupils of the Region of Murcia. Participants were recruited from whole class groups attending grades 1-4 of 13 secondary public and private schools in the Region of Murcia (Spain). The total sample was made up of 1,239 students (49.4% males and 50.6% females) aged between 11-18 years, average age = 14.39 ($SD = 1.43$). We ask for participation of about the 40% of secondary school centers and we obtained a response rate of about 55%. We do not observe any bias due to the representativeness of public vs. private centers or rural vs. urban centers in our final sample. Then we consider this sample as representative (with a maximal error of 3%) of the Secondary pupils of the Region of Murcia during 2008-2010 years.

Instruments

Two instruments were used.

- Data for CAS and consume were included in a self-completion questionnaire, based on the questionnaire ESTUDES- *Encuesta Estatal sobre Uso de Drogas en Estudiantes de Enseñanzas Secundarias* (Delegación del Gobierno para el Plan Nacional sobre Drogas [DGPNSD], 2008) adapted by Cerezo, Méndez, and Rabadán (2009). The 82 items grouped into: socio-demographic data, substance use, students sports and health activities, dissocial behavior and bullying. The answers were given by circling or crossing the letter next to the option chose. Reliability according to Cronbach' alpha coefficient in our sample was .70. For this study, were selected only 16 items, as related in variables.
- Social risks for consumption were evaluated by the Interpersonal Risk Factors Questionnaire -FRIDA- (Secades, Carballo, Fernández-Hermida, García, & García, 2006), with 90 items in a Likert scale with 3 or 5 points, providing a global index of vulnerability and seven risk factors for consume: Factor 1 (F1), *Family reaction*

against drugs consumption (items 1-15) ($\alpha = .88$). High values indicate low reaction (family do not get annoyed if they catch him or her smoking). Factor 2 (F2) *Peers* (items 16-27) evaluates the attitude of friends about drugs consumption, friends' consumption and risk activities ($\alpha = .86$). High levels indicate that friends have a permissive attitude towards drugs and may even be drugs consumers. Factor 3 (F3) *Access to drugs* (items 28-35) evaluates how easily adolescents have access to drugs ($\alpha = .89$). The higher the value, the more difficult the access. Factor 4 (F4) *Family risks* (items 37-51) inquires into family relationships, drug consumption and family conflicts ($\alpha = .64$). High values indicate family conflicts, drugs consumption and abuse. Factor 5 (F5) *Family education about drugs* (items 52-58) shows the level of information that adolescents receive from their families ($\alpha = .85$). High values indicate a lack of rules about drugs consumption. Factor 6 (F6) *Family protective activities* (items 59-81), such as leisure and sports activities, the quality in relationships and academic achievement ($\alpha = .74$). High values indicate less protective activities. Factor 7 (F7) *Parental educative styles* (items 82-90) evaluate family social norms and how they are established ($\alpha = .70$). It informs about how democratic or authoritative the parental style is. A higher score indicates more permissiveness, while low score indicates high parental control. Global reliability according to Cronbach' $\alpha = .92$. In this study was $\alpha = .92$.

Procedure

All students enrolled in the class took part in the study after the corresponding institutional and school parental consent. Students were approached in the school in their own classes. They were assured of anonymity and confidentiality and were informed that all information would be used only for research purposes.

The adolescents answered both questionnaires using a standardized script and written instructions. It took about 90 minutes. Answer sheets were codified and entered in a data base for SPSS (version 19.0) and R program (version 2.15.1).

Variables

The variables of interest were about three constructs:

- a) Socio-demographic variables: age and gender
- b) Response variables: CAS (7 items): Participate in a fight or physical aggression; having a major conflict or discussion with parents or siblings; running away from home for more than a full day; being arrested by law enforcement; driving under the influence of alcohol, and being a passenger in a motor vehicle driven under the influence of alcohol. CONSUME (7 items): consume Cigarettes daily; consume alcoholic beverages almost every week; get drunk practically every week; Take tranquilizers or sleeping pills without a prescription; consume hashish or marijuana; consume cocaine and consume other drugs. CAS rate were performed in accordance with the number of dissocial behaviors marked for the last 12 months. Having account that for "Driving under the influence of alcohol" and "Being a

Table 1 Sample distribution according to CAS and consumption.

Variable	Frequency	Percentage
<i>Gender</i>		
Male	612	49.4%
Female	627	50.6%
<i>Age</i>		
11-13	346	27.9%
14-15	618	49.9%
16-18	275	22.2%
<i>Antisocial behaviour</i>		
No	550	44.4%
Low	500	40.4%
Moderate	140	11.2%
High	39	3.2%
Very High	10	0.8%
<i>Consumption level</i>		
No	873	71.3%
Low	281	22.7%
Moderate	60	4.8%
High	14	1.1%
Very High	1	0.1%
<i>Poly-consumption</i>		
No	973	78.5%
Low	80	6.5%
Moderate	144	11.6%
High	12	1%
Very High	30	2.4%
<i>Global vulnerability</i>		
No	8	0.7%
Low	4	0.3%
Moderate	254	21.1%
High	738	61.1%
Very High	203	16.8%

passenger in a motor vehicle driven under the influence of alcohol”, from 1-2 days rates 0.5 and 3 or more days rates 1. All the answers were coded with the following intervals: No (0); Low (1); Moderated (2), High (3-4) and Very high (5-7); consume rates were elaborated taking account the number of days (in the last 12 months) that they marked as “substance consumed”, with the following interval: None (0), Low (1), Moderate (2), high (3-5), and Very high (6-7); poly-consumption rate, were elaborated by taking into account the number of days that they have consumed two or more substances within two hours, with an inferior limit (0) and a superior limit (2). Intervals were coded depending of the number of days: None (0); 1 -2 days rates Low (0.5); 3-9 rates Moderate (1); 20-39 rates High (1.5); 40 days or more rates Very high (2). For dichotomized values: No = 0, positive values = 1.

c) Moderating variables: social risk factors. According to the FRIDA questionnaire, family risks factors were F1, F4, F5, F6 and F7 and Friends’ risk factors were F2 and F3. Data were coded in a scale: 0-1.5 = Very Low; 1.6-3 = Low; 3.1-4 = Moderate; 4.1-5.5 = High; 5.6-7 = Very high.

Data analysis

To answer the research questions the following data analyses were conducted. For descriptive analysis a chi-square test of independence was used. The relation between social risks factors in CAS and consume was examined by Pearson’ correlations among all variables, and Student *t*-test were applied to analyze differences by gender. Moderate hierarchical multiple regression analysis (MHMR) was applied to evaluate the moderating role of family and friends risk factors on CAS and Consume (Ato & Vallejo, 2011). SPSS (version 19.0) and R package Pequot (Mirisola & Seta, 2011) were used for the analysis.

Results

Prevalence of CAS and consume

Prevalence of CAS in the sample (see Table 1) was 55.6%, that is to say that, more than one in two surveyed committed any kind of antisocial behavior in the last 12 months, 140 (11.2%) students presented moderate level and 49 (4.0%) high or very high rates.

About consume, 873 (71.3%) students did not use any type of drug, 281 (22.7%) some times; 60 (4.8%) moderated, and 15 (1.2%) high or very high rate (5% males, 7% females). From the whole sample, 28.73% frequently used some kind of substance in the last 12 months, of which 27.52% consumed one or two types and 1.1% between 3-7 types of drugs. 21.5% of teenagers poly-consumed.

Prevalence of CAS and consume by gender and age

The incidence of CAS by gender was similar (58.2% boys, 56.6% girls), also in consume (26%-30.9%) or in poly-consume (23.3%-19.6%), but there was significant gender differences in the type of drug consumed: girls are more likely to use cigarettes and tranquilizers, while boys consume any type of substances ($p = .000$).

Data shows that CAS, consume and poly-consume increase in value with increasing age, presenting significant differences in all cases ($p = .000$) (see Table 2).

Pearson’ correlation analysis shows a significance relationship between CAS and consume ($r = .41$; $p < .001$); Poly-consume ($r = .37$; $p < .001$) and age ($r = .22$; $p < .001$), but not with gender (see Table 3).

Gender differences in family and friends’ risk factors

Statistic analyses show gender differences in some Family risk factors (see Table 4): in (F1), *Family reaction against drug consumption*, the entire sample reach high scores, but girls score higher ($M = 3.52$; $p = .001$), which means that their family reacts with less anger; (F5) *Family education about drug*. Although all the sample scores high, girls score higher ($M = 4.43$; $p < .005$), which implies that family does not sufficiently explain the problems associated with drug and that there is a lack of important rules. (F6) *Family*

Table 2 Contingencies by gender and age for CAS, consumption, poly-consumption and global vulnerability. With positive values.

Variable	Gender	χ^2 (DF)	Age	χ^2 (DF)
	M/F	<i>p. associated</i>	11-13/14-15/>15	<i>p. associated</i>
CAS	58.2%/56.6%	2.859 ₍₄₎ ; <i>p</i> = .582	37.2/51.7/64.7	77.72 ₍₂₄₎ ; <i>p</i> = .000
Consume	26.5%/30.9%	6.984 ₍₄₎ ; <i>p</i> = .137	13.3/29.0/46.7	106.57 ₍₁₄₎ ; <i>p</i> = .000
Polyconsume	23.3%/19.6%	4.923 ₍₄₎ ; <i>p</i> = .295	13.7/20.9/33.0	47.19 ₍₈₎ ; <i>p</i> = .000
Global vulnerability	73.5%/82.2%	16.220 ₍₅₎ ; <i>p</i> = .006	67.83/79.57/87.45	61.62 ₍₁₀₎ ; <i>p</i> = .000

Note. F = female; M = male.

Table 3 Pearson's correlations, means and standard deviations (SD) by gender with CAS, consume, poly-consume and risk factors.

Variable	1	2	3	4	5	6
1. CAS	1					
2. Consume	.41**	1				
3. Polyconsume	.37**	.45**	1			
4. Global vulnerability	.16**	.21**	.11**	1		
5. Age	.22**	.30**	.16**	–	1	
6. Gender	–	–	–	.09**	–	1
F1	.06**	–	–	.54**	.28**	.14**
F4	–	.09**	–	.32**	.05*	
F5	.09**	.11**	–	.34**	.17**	.08**
F6	–	–	–	–	–.09**	–.09**
F7	.18**	.20**	.11**	.45**	.28**	.45**
F2	.09**	.12**	–	.36**	.17**	.36**
F3	–.22**	–.23**	–.18**	.19**	–.24**	–
Global vulnerability	.16**	.21**	.11**	–	.19**	.09**
<i>Mean and SD</i>						
M Males	0.76	0.33	0.22	4.82		
M Females	0.75	0.39	0.19	4.97		
SD Males	0.86	0.62	0.45	0.78		
SD Females	0.80	0.64	0.44	0.71		

Level of signification: **p* < 0.05; ***p* < 0.01. Means and SD from *t*-test.

protective activities presents high risk in general, but with higher score in boys ($M = 4.51$; $p < .001$), which implies that boys perform less protection activities and perceive lower quality relationships between family members than girls. For (F7) *Parental educative styles*, boys and girls perceive democratic styles but girls score higher ($M = 4.97$; $p < .001$), indicating that girls take more part in decisions and perceive greater permissiveness, while boys feel more parental control. *Friends' support* (F2) shows high levels and there are no gender differences, which suggest that for boys or girls, the attitude of friends over consumption is similar. (F3) *Access to drugs*, with moderated values, is similar for boys and girls. Lastly, although the global index of vulnerability is high in the entire sample, it is higher among girls ($M = 4.97$; $p < .001$) (see Table 4).

Risk factors levels moderators between disocial behavior and substance use

A moderated hierarchical multiple regression (MHMR) analysis was applied in order to know what factors of FRIDA questionnaire could be moderators in the relationship between CAS and consume. Due to the differences found between males and females we also include gender as a second moderator variable. MHMR methodology may suffer serious problems of multicollinearity when interaction terms are composed of correlated terms (Cohen, Cohen, West, & Aiken, 2003; Cortina, 1993). One of the most stable solutions to avoid this problem is to use the residual centering technique (Lance, 1988). To this aim we used R package Pequot (Mirisola & Seta, 2011).

Table 4 Risk factors. Differences by gender (Male/Female).

Variable	<i>t</i> (df)	Mean M/F	Means differences	<i>p</i>
F1 (Reaction familiar)	$t_{(1204)} = -5.02$	3.07/3.52	-0.45	.000
F4 (Family risk)	$t_{(1204)} = -.96$	5.58/5.63	-0.04	ns
F5 (Familiar education)	$t_{(1187)} = -2.78$	4.27/4.43	-0.16	.005
F6 (Protectors activities)	$t_{(1196)} = 3.37$	4.51/4.33	0.18	.001
F7 (Educative style)	$t_{(1157)} = -3.58$	4.79/4.97	-0.18	.000
F2 (Friends' attitude)	$t_{(1237)} = -1.45$	4.35/4.44	-0.08	ns
F3 (Dugs' access)	$t_{(1237)} = -1.10$	3.60/3.69	-0.09	ns
Global vulnerability	$t_{(1205)} = -3.44$	4.82/4.97	0-.14	.000

Note: F = female; M = male; ns = no signification.

Table 5 Hierarchical multiple linear regression models for the analysis of moderator effects with gender and family related factors (F1 and F7).

Predictors	Model 1 (additive)	Model 2 (1st order interactive)	Model 3 (2nd order interactive)
CAS	.36***	.35***	.35***
F1	.21***	.21***	.21***
Gender	.02	.02	.02
CAS * F1		.13***	.13***
CAS * Gender		.02	.02
F1 * Gender		.06*	.06***
CAS * F1 * Gender			.00
R ² change	.27***	.02**	.00
CAS	.35***	.35***	.35***
F7	.12***	.13***	.13***
Gender	.04	.04	.04
CAS * F7		.12***	.12***
CAS * Gender		.06*	.06*
F7 * Gender		.04	.04
CAS * F7 * Gender			.03
R ² change	.16***	.02***	.00

With any one of factors of FRIDA questionnaire we test three different models: an additive model, including predictors CAS and gender, a first-order interactive model including 2-way interactions and a third-order interactive model including the 3-way interaction. Table 5 summarizes the standardized beta coefficients and R²-changes of all models used with F1 and F7 family-related factors and Table 6 with F2 and F3 friends-related factors. In all models Variance Inflation Factors (VIF) were reduced to their minimum value (range 1-1.04). Figure 2 (A, B) shows plots of simple slopes to summarize moderators combination interaction for F1 and F7 family-related factors. Figure 3 (A, B) summarizes moderators combination interaction for F2 and F3 friends-related factors.

Two family factors moderate the relation between CAS and Consume: F1 and F7, and the 1st order interactive model is the best conclusive stable model. Table 5 summarizes principal data. There is a significant interaction between CAS and F1 (.137; $p < .001$); F1 and gender (.06; $p < .05$)

-Change $R^2 = .024$; $p < .01$ -; and CAS and F7 (.12; $p < .001$); and CAS and gender (.06; $p < .05$) - Change $R^2 = .024$; $p < .001$ -. These data indicates that when risk factors (F1 and F7) score high, the moderation in the relation among CAS and Consumption is significant for all adolescents.

The moderating role associated to gender is higher for girls, with low and high values (see Figure 2). It is the same with the interaction of factor F1: when F1 reaches a low level, both CAS and Consumption score low, while when F1 scores high, both CAS and consumption do so, especially among girls. We appreciate also that F7 has a high degree of restraint between the CAS and Consumption, especially among girls, which confirms less parental control, more permissiveness and favors the development of antisocial behavior and substance use.

About friends' risk factors, Table 6 summarizes the results. Significant factors are: F2 (Peers) and F3 (Access to drugs) and the 1st order interactive model is the best conclusive stable model. We appreciate a significant

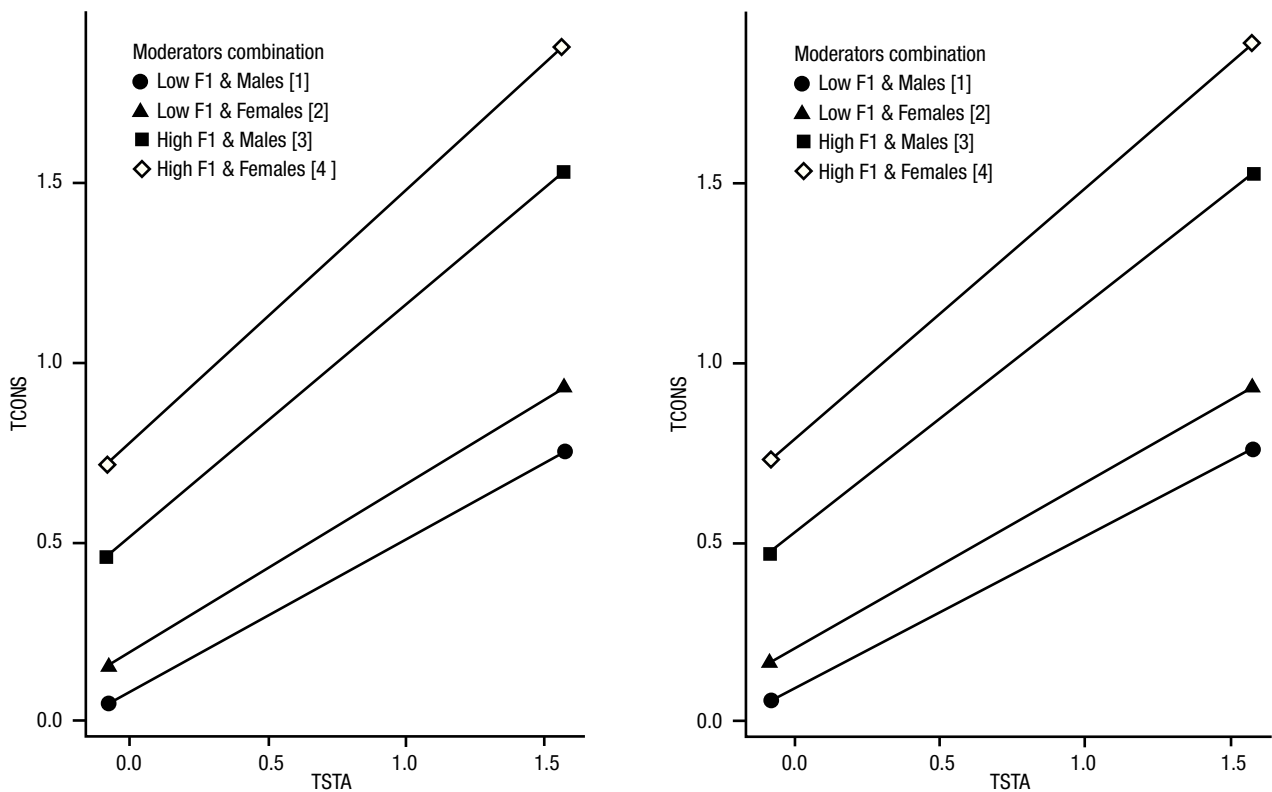


Figure 2 Plot of simple slopes of interaction of gender and F1 and F7 family-related factors. (TCONS = Consume rate, TSTA= Dissocial rate).

Table 6 Hierarchical multiple linear regression models for the analysis of moderator effects with gender and friends related factors (F2 and F3).

Predictors	Model 1 (additive)	Model 2 (1st order interactive)	Model 3 (2nd order interactive)
CAS	.40***	.40***	.40***
F2	.105**	.10***	.10***
Gender	.04	.04	.04
CAS * F2		-.09***	-.09***
CAS * Gender		.03	.03
F2 * Gender		.07**	.07**
CAS * F2 * Gender			.06**
R ² change	.18***	.01**	.00**
CAS	.38***	.38***	.38***
F3	-.14***	-.14***	-.14***
Gender	.05*	.05*	.05*
CAS * F3		-.10***	-.10***
CAS * Gender		.05*	.05*
F3 * Gender		.02	.02
CAS * F3 * Gender			.04
R ² change	.19***	.01**	.00

interaction between CAS and F2 (-.09; $p < .001$) and F2 and gender (.07; $p < .01$) -Change $R^2 = .016$; $p < .01$ -, and CAS and F3 (-.10; $p < .001$) and CAS and gender (.05; $p < .05$) -Change $R^2 = .014$; $p < .01$ -. We can also see a significant moderating trend of F2 between CAS and consume for both genders, but it is enhanced in girls.

Figure 3 shows that, among boys, the greater difficulty of access to drugs, the lower the CAS-consumption ratio, while among the girls a double positioning is seen. On the one hand, girls with low perceived difficulty to get drugs, with increasing consumption, it is still considered easier to get them, while those who considered it difficult to access

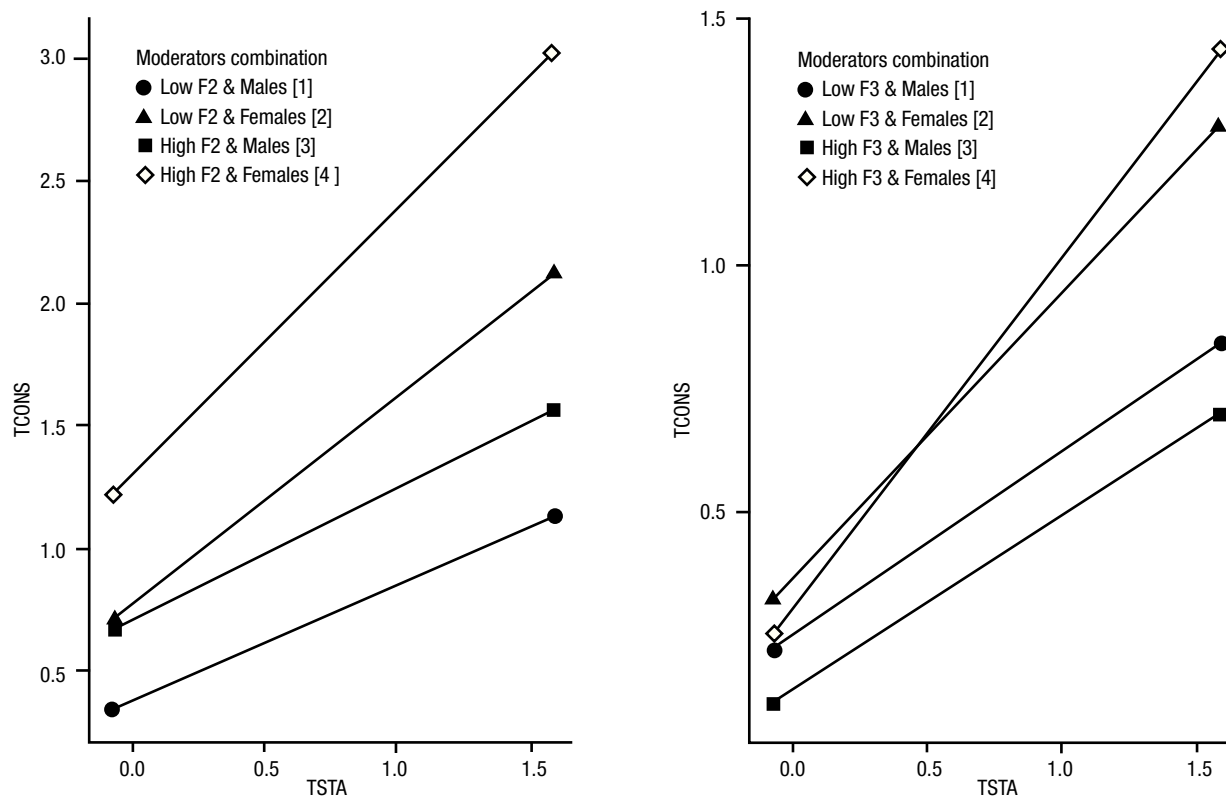


Figure 3 Plot of simple slopes of interaction of gender and F2 and F3 friends-related factors (TCONS = Consume rate, CAS= Disocial rate).

drugs, with increasing rate of consumption, considered it more difficult. There is a point of agreement between both subgroups when both CAS and consumption are low.

Discussion

About the first objective of this study, we found that the prevalence of antisocial behavior and drug use in adolescents among secondary students, is relatively frequent (Alfonso et al., 2009; Estevez & Emler, 2011), but the rate observed in this study is higher than that observed by Delegación del Gobierno para el Plan Nacional sobre Drogas [DGPNSD] (2011), which found 20% for alcohol consumption and 9.5% for any other substances.

The study shows that over 50% of students participate in activities of a recognized antisocial type, which leads us to confirm the taste for risk situations in this life stage (Farrington, 2005). There is no gender difference in rates of antisocial behavior, consume and poly-consumption, indicating that this is a “general standards” and, there are no differences by gender, in contrast with Estevez and Emler (2011), but there are significant gender differences about the type of drug consumed: girls are more likely to use cigarettes and tranquilizers, while boys consume any type of substances what is in line with the studies of Moral-Jiménez, Ovejero-Bernal, Castro, Rodríguez-Díaz, and Sirvent-Ruiz (2011). We also did find differences in the

values of the overall vulnerability index, with a higher perception of risk in girls than in boys. In general, boys and girls alike perceive moderate or high risk factors for drug abuse in their family and friends group (Becoña et al., 2012; Gervilla et al., 2011).

About age, we find initial consume at 11, what represent a novel, because previous studies settled this about 14. We also find that risk behaviors increase in value with increasing age, presenting significant differences in all cases.

About the objectives proposed in this study about the moderator effects of risk factors, we find that, two main family factors contribute for the antisocial behavior in adolescents: F1, indifference family reaction against drugs or even consume, and F7, permissive and tolerant parental socialization style (Moreno et al., 2009). The change from low to high is homogeneous for boys or girls, that is to say that there are not differences by gender. The moderating value of the group of friends in the relationship between antisocial behavior and substance use is given by F2 (Peers) because friend' attitude about drugs consumption is positive and they do risk activities (Gervilla et al., 2011), and F3 (*Access to drugs*), this factor means that adolescents easily have access to drugs (Alfonso et al., 2009). We did not find family or friends factor as mediations in those conducts, but they really moderate them.

The main findings of this study alert to the moderating role of risk factors for consumption and antisocial behavior among adolescent students in secondary education,

highlighting the permissive family atmosphere and support from friends, as well as the ease drugs access.

The study also points out that those interactions are different for boys and girls. Girls show greater family risk for substances consumption because of parental permissiveness and the lack of established standards on consumption but they do more protective activities. Also the moderating role of friends is different by gender. The moderating trend of F2 (attitude of friends about drugs) between CAS and Consume is enhanced in girls, which means that group of friends is a higher risk factor for girls than for boys, especially among those that score high in CAS and Consume. Finally, F3 (easily access to drugs) is presented as a moderator in the relationship CAS-Consume between adolescents in boys and girls alike, that means that all of them have easy access to drugs and this facilitates CAS and Consume. But in this factor is well worth mentioning that the moderating role is higher for girls for boys and when the relation is higher they show divergent values for girls. F3 is homogeneous in boys but no for girls.

Summing up the differences by gender, this study shows that there is an interaction with the reaction of the family and that it is different for boys and girls, as well as the family educational style. Girls are at greater vulnerability for consumption due to permissiveness and lack of family control, perhaps because the type of substances they use (snuff and tranquilizers) are "socially acceptable". Similarly, the moderating role of friends' attitudes to consumption is determinant, noting a higher incidence among girls, indicating that they are more influenced than boys. Finally, ease of access to drugs moderates the relationship between CAS and consumption in both genders. Among girls there is a point of intercession when girls score low in CAS and Consumption. This suggests that there is a dual position among girls, on the one hand, those that when they start consuming, believing that access to drugs is easy, when they increase drug use, the moderating role is enhanced. By contrast, those who believed it would be difficult to get drug, consume less and maintain this belief. So we can conclude that when the girls have tried drugs confirm their perception of ease to get them. The study also indicates that girls are generally more vulnerable than boys.

The interest of this study should be noted in terms of contribution to the knowledge of the importance of environmental factors in the development of antisocial behavior and consumption among adolescents, differentiating between boys and girls. This knowledge will facilitate the development of prevention and intervention policies in context, and especially the division of responsibilities, not only of teachers but also of the family and of the institutions involved.

The results of this study should be interpreted in the light of some limitations. First there is the nature of the sample of the adolescent population, which is limited to a specific region. In this sense, other studies find that democratic parental style is a protective and not a risk factor, as we found in this work (Alfonso et al., 2009). As proposal for future research, it would also be necessary to conduct a prospective study in order to know more precisely the time of initiation of young people in these behaviors and how environmental factors affect along the life cycle. Moreover, our analysis is based on the reports of the people

involved; it would, in future studies, be useful to expand sources of information to family and friends as well as incorporating other types of analysis that could confirm the use of substances and reinforce the moderating role of family and friends risk factors.

References

- Aguilar-Cárceles, M. M. (2012). The influence of the family context in the development of violent behaviors during adolescence: Risk and protective factors. *Revista de Criminología*, 54, 27-46.
- Alfonso, J., Bueno-Medina, T., & Espada, J. (2009). Factores de riesgo predictores del patrón de consumo de drogas durante la adolescencia. *Anales de Psicología*, 25, 330-338.
- American Psychiatric Association, APA (2000). *DSM-IV-TR Diagnostic and statistical manual of mental disorders (4th. ed.)*. Washington, D.C.: American Psychiatric Association.
- Ato, M., & Vallejo, G. (2011). Los efectos de terciereas variables en la investigación psicológica. *Anales de Psicología*, 27, 550-561.
- Becoña, E., Martínez, U., Calafat, A., Juan, M., Fernández-Hermida J. R., & Secades-Villa, R. (2012). Parental style and drug use: A review. *Drugs: Education and Policy*, 19, 1-10.
- Bradshaw, C., Glaser, B., Calhoun, G., & Bates, J. (2006). Beliefs and practices of the parents of violent and oppositional adolescents: An ecological perspective. *The Journal of Primary Prevention*, 27, 245-263.
- Carlyle, K. E., & Steinman, K. J. (2007). Demographic differences in the prevalence, co-occurrence, and correlates of adolescent bullying at school. *Journal of School Health*, 77, 623-629.
- Cerezo, F., & Méndez, I. (2012). Conductas de riesgo social y de salud en adolescentes. Propuesta de intervención contextualizada para un caso de bullying. *Anales de Psicología*, 28, 705-719.
- Cerezo, F., Méndez, I., & Rabadán, R. (2009). *Encuesta para estudiantes de enseñanzas secundarias*. No published.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*. Mahwah, N.Y.: LEA.
- Cortina, J. M. (1993). Interaction, nonlinearity and multicollinearity: Implications for multiple regresión. *Journal of Management*, 19, 915-922.
- Delegación del Gobierno para el Plan Nacional sobre Drogas, DGPNSD (2008). *ESTUDES-Encuesta Estatal sobre Uso de Drogas en Estudiantes de Enseñanzas Secundarias*. Madrid: Ministerio de Sanidad y Política Social.
- Delegación del Gobierno para el Plan Nacional sobre Drogas, DGPNSD (2011). *Informe ESTUDES 2010*. Madrid: Ministerio de Sanidad y Consumo.
- Estevez, E., & Emler, N. (2011). Assessing the links among adolescent and youth offending, antisocial behavior, victimization, drug use, and gender. *International Journal of Clinical and Health Psychology*, 11, 269-289.
- Farrington, D. (2005). Childhood origins of the antisocial behavior. *Clinical Psychology and Psychotherapy*, 12, 177-190.
- Gervilla, E., Cajal, B., & Plamer, A. (2011). Quantification of the influence of friends and antisocial behavior in adolescent consumption of cannabis using the ZINB model data mining. *Addictive Behaviors*, 36, 368-374.
- Hartley, J. (2012). New ways of making academic articles easier to read. *International Journal of Clinical and Health Psychology*, 12, 43-160.
- Inglés, C. J., Delgado, B., Bautista, R., Torregrosa, M.S., Espada, J. P., García-Fernández, J. M., Hidalgo, M. D., & García-López, L. J. (2007). Factores psicosociales relacionados con el consumo de alcohol y tabaco en adolescentes españoles. *International Journal of Clinical and Health Psychology*, 7, 403-420.

- Jiménez, T., Musitu, G., & Murgui, S. (2008). Funcionamiento familiar y consumo de sustancias en adolescentes: el rol mediador de la autoestima. *International Journal of Clinical and Health Psychology, 8*, 139-151.
- Justicia, F., Benítez, J. L., Pichardo, M. C., Fernández, M., García, T., & Fernández, M. (2006). Aproximación a un nuevo modelo explicativo del comportamiento antisocial. *Revista Electrónica de Investigación Psicoeducativa, 4*, 131-150.
- Lance, C. E. (1988). Residual centering, exploratory and confirmatory moderator analysis and decomposition of effects in path models containing interactions. *Applied Psychological Measurement, 12*, 165-175.
- Mason, M. J., Mennis, J., & Schmidt, C. D. (2011). A social operational model of urban adolescents' tobacco and substance use: A mediational analysis. *Journal of Adolescence, 34*, 1055-1063.
- Mirisola, A., & Seta, L. (2011). *Pequod package: moderated regression with mean and residual centering and multiple slope analysis*. Perugia: University of Perugia.
- Moral-Jiménez, M. D., Ovejero-Bernal, A., Castro, A., Rodríguez-Díaz, F. J., & Sirvent-Ruiz, C. (2011). Modificación de actitudes hacia el consumo de sustancias en adolescentes: seguimiento de las diferencias inter-género. *Journal of Clinical and Health Psychology, 11*, 291-311.
- Moreno, D., Estévez, E., Murgui, S., & Musitu, G. (2009). Relación entre el clima familiar y el clima escolar: el rol de la empatía, la actitud hacia la autoridad y la conducta violenta en los adolescentes. *International Journal of Psychology and Psychological Therapy, 9*, 123-136.
- Muñoz, A. P., & Garcés de los Fayos, E. J., (2009). Analysis of variables influencing adaptation and socialization: Aggressive behavior in adolescence. *Ansiedad y Estrés, 15*, 131-150.
- Peña, E., Andreu, J. M., & Graña, J. L. (2009). Multivariante model of antisocial behavior and substance use in Spanish Adolescents. *Journal of Child and Adolescent Substance Abuse, 18*, 207-220.
- Pérez, M. C., & Gázquez, J. J. (2010). Variables relacionadas con la conducta violenta en la escuela según los estudiantes. *International Journal of Psychology and Psychological Therapy, 10*, 427-437.
- Radliff, K. M., Wheaton, J. E., Robinson K., & Morris, J. (2012). Illuminating the relationship between bullying and substance use among middle and high school youth. *Addictive Behaviors, 37*, 569-572.
- Secades, R., Carballo, J. L., Fernández-Hermida, J. R., García, O., & García, E. (2006). *Cuestionario de factores de riesgo interpersonales para el consumo de drogas en adolescentes (FRIDA)*. Madrid: TEA.
- Thurnherr, J., Berchtold, A., Michaud, P-A., Akre, C., & Suris, J-C. (2008). Violent adolescents and their educational environment: A multilevel analysis. *Journal of Developmental and Behavioral Pediatrics, 29*, 351-359.