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The Role of the Family in Promoting Responsible Substance Use in Adolescence

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Abstract The aim of this study was to examine the role of family dimensions in tobacco, alcohol, and cannabis use among adolescents. Furthermore, we investigated how demographic variables (adolescents' gender and age) influence substance use and moderate the relationship between family dimensions and substance use. The sample consisted of 14,825 adolescents aged 13–14, 15–16, and 17–18 who participated in the 2006 edition of the Health Behaviour in School-aged Children (HBSC) study in Spain. The HBSC-2006 questionnaire included demographic variables (gender and age), substance use variables (tobacco, alcohol, and cannabis use), and family dimensions (parental affection, parental promotion of autonomy, family activities, adolescent disclosure, parental solicitation, and parental knowledge). The results indicated that adolescent disclosure, family activities, and parental knowledge had a significant effect on substance use. Specifically, maternal variables were shown to be slightly more relevant than paternal variables. Additionally, substance use was higher in older adolescents than in younger adolescents, and boys smoked less than girls. The discussion focused on how family dimensions promoted responsible substance use in adolescence.

Keywords Adolescence · Family dimensions · Tobacco use · Alcohol use · Cannabis use

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Introduction

Adolescence is a decisive stage in the learning and consolidation of healthy habits that define a lifestyle. Experimentation with unhealthy behaviours usually begins in early adolescence (Pastor et al. 1999), possibly because adolescents tend to seek new experiences and are unable to accurately calculate the risks associated with some behaviours (Oliva and Parra 2004). Therefore, adolescence is the most suitable stage of life to avoid or change any unhealthy habits that might be adopted, such as substance use, considering that these behaviours condition the development of either a healthy or unhealthy lifestyle in adulthood (Elliot 1993).

The most used substances among adolescents are tobacco, alcohol, and cannabis (Currie et al. 2008; Delegación del Gobierno para el Plan Nacional sobre Drogas 2009; Moreno et al. 2011). The prevalence of use for these substances in the last 30 days among Spanish adolescents is 58.5 %, 32.4 %, and 20.1 % for alcohol, tobacco, and cannabis, respectively, whereas the prevalence of use other substances is between 0.5 % and 2 % (Delegación del Gobierno para el Plan Nacional sobre Drogas 2009). For this reason, only these substances are analysed in this research.

Concerning gender differences, research has found differences between boys and girls in substance use. Boys drink more alcohol (Currie et al. 2008; Hibell et al. 2009; Moreno et al. 2011) and take more illegal drugs (Delegación del

Gobierno para el Plan Nacional sobre Drogas 2009; Hibell et al. 2009; Moreno et al. 2011). Cannabis use, in particular, is higher in boys than in girls (Currie et al. 2008; Delegación del Gobierno para el Plan Nacional sobre Drogas 2009; Moreno et al. 2011; Observatorio Europeo de las Drogas y las Toxicomanías 2010). On the other hand, girls smoke more tobacco than boys (Delegación del Gobierno para el Plan Nacional sobre Drogas 2009; Hibell et al. 2009; Moreno et al. 2011). In spite of these differences between girls and boys, there are also studies that have found similarities. Regarding alcohol use, the percentage of boys and girls who use alcohol is similar, especially for alcohol use at least once in the life and during the last 30 days (Delegación del Gobierno para el Plan Nacional sobre Drogas 2009). With respect to cannabis use, girls are as likely to use cannabis at least once in their life and during the last 30 days as boys (Currie et al. 2008).

Moreover, there are differences related to the age at which adolescents use substances, with evidence indicating that substance use increases during adolescence. It is clear that tobacco use, alcohol use, and cannabis use are greater in older adolescents than in younger adolescents (Currie et al. 2008; Delegación del Gobierno para el Plan Nacional sobre Drogas 2009; Moreno et al. 2011).

On the other hand, the efforts of parents to prevent behaviour problems and promote positive development in their adolescents has become a very important area of current research in developmental psychology (Kerr et al. 2008).

The quality of the parent–child relationship is important for adolescent development (Hair et al. 2008b, 2009), although the relationships with both parents are important, the maternal influence is slightly higher than the paternal influence (Hair et al. 2008b). From a typological approach, adolescents with authoritative parents are more well-adjusted, as indicated by their lower substance use (Oliva and Parra 2004), and negligent mothers are more damaging to adolescents' adjustment than negligent fathers (Simons and Conger 2007). This research does not take into account the typological approach; instead, it uses the dimensional approach because this study analyses important dimensions of the authoritative style in adolescence (affection, promotion of autonomy, family activities, solicitation, disclosure, and knowledge) and their influence on substance use among adolescents. To understand the real importance of various family dimensions, it is necessary to distinguish between these dimensions and between the maternal and paternal dimensions (Smetana et al. 2006).

Good parent–child relationships help to reduce substance use (Hair et al. 2009; Kuntsche et al. 2009; Ramos et al. 2011; Secades-Villa et al. 2005), as does time spent in activities with family (Coley et al. 2008; Secades-Villa et al. 2005; Sweeting et al. 1998). Perhaps, the perception of a positive family climate during family activities helps to increase the protective effect of these activities with regard to substance use (White and Halliwell 2010).

Moreover, effective parental habits have a considerable protective effect on adolescents' substance use (Macaulay et al. 2005). Affectionate parents (Li et al. 2010; Martínez Álvarez et al. 2003; Parra and Oliva 2006; Rodrigo et al. 2004) who properly promote the autonomy of their adolescent children have been shown to be associated with lower substance use by adolescents (Goldstein et al. 2005).

The researchers argue that a close parent–child relationship creates a situation where the parents are psychologically present when their adolescents are tempted to engage in risk behaviours. Adolescents most likely think about the disappointment or embarrassment that their parents would have if parents know about their misbehaviour, which could dissuade them from engaging in these behaviours (Kerr and Stattin 2003). Furthermore, if they engage them, they will assess their misbehaviour in a more negative way (Kiriakidis 2006).

In addition, parental monitoring, such as parental solicitation (that is, the parental skills related to asking children for information), is associated with lower substance use by adolescents (Laird et al. 2010; Li et al. 2010; Martínez Álvarez et al. 2003; Parra and Oliva 2006). Parents' efforts of tracking and monitoring are necessary to deter adolescents from risk behaviours and to promote positive behaviour patterns (Barnes et al. 2006; Brown et al. 1993; Ghandour 2009; Oliva and Parra 2004).

Adolescent disclosure also contributes to lower substance use (Engels et al. 2005; Ghandour 2009; Jiménez-Iglesias et al. 2012a; Keijsers et al. 2010; Stavrinides et al. 2010). If adolescents trust in their parents to disclose information about their lives, parents can guide their adolescents and protect them from behaviour problems. On the contrary, if adolescents do not share this information, it is more likely that they remain involved in risky behaviours without considering the negative consequences (Marshall et al. 2005). Therefore, the secrecy or the concealment is associated with a higher engagement in problem behaviours among adolescents (Kerr et al. 2010; Laird and Marrero 2010).

Parental solicitation and adolescent disclosure reflect a high quality of parent–child communication (Keijsers et al. 2010), which is a protective factor for substance use (Harakeh et al. 2010; Jiménez-Iglesias et al. 2012a).

Finally, all of these family dimensions, especially a parent–child relationship that is close and communicative, promote parental knowledge (Bumpus and Rodgers 2009; Crouter and Head 2002). Parental knowledge allows parents to be informed about the lives of their children. This is particularly important during adolescence because this is a period in which opportunities for taking part in problematic activities increase, while direct parental supervision decreases (Jacobson and Crockett 2000). In this sense, parental knowledge has been identified as an important

component of effective parenting, as it is related to lower substance use (Coley et al. 2008; Jiménez-Iglesias et al. 2012a; Li et al. 2000a, b; Rai et al. 2003; Richards et al. 2004; Soenens et al. 2006; Tebes et al. 2011).

Considering the literature discussed here, the aim of this study is to examine how different variables related to the family context (parental affection, parental promotion of autonomy, adolescent disclosure, parental solicitation, and family activities) are associated with tobacco, alcohol, and cannabis use and how the demographic variables influence substance use and moderate the relationship between family dimensions and substance use. Furthermore, we investigate whether the substance use variance that cannot be explained by these family dimensions can be explained by perceived parental knowledge. The influence of parental knowledge is evaluated because the aforementioned family dimensions influence parental knowledge (Jiménez-Iglesias et al. 2013). These objectives are achieved by analysing the maternal and paternal variables separately and together to evaluate the influence of the mother and father on substance use in adolescents.

Method

Participants

The sample consisted of 14,825 boys and girls aged 13–14, 15–16, and 17–18, who were selected for the 2006 edition of the WHO international survey Health Behaviour in School-aged Children (HBSC) in Spain.

Measures

The HBSC-2006 questionnaire for Spain was used. The Research Ethical Committee of the University of Seville approved the questionnaire. For this study, demographic variables were used (gender and age), and family and substance use variables were included.

Perceived Parental Affection and Perceived Parental Promotion of Autonomy

These variables were used as scales based on the dimensions of affection and the promotion of autonomy, respectively, from the *Parental Bonding Inventory-Brief Current form, PBI-BC* by Klimidis et al. (1992) (the HBSC-PBI). The following items were used to obtain the perceived maternal and paternal affection scale: "My mother/father… helps me as much as I need/is loving/understands my problems and worries/makes me feel better when I am upset". The following items were used to obtain perceived maternal and paternal promotion of autonomy: "My mother/father… lets me do the things I like doing/likes for me to make my own decisions/tries to control everything I do/treats me like a baby".

Family Activities

This variable concerns the frequency with which shared family activities are performed and is based on the items used by Sweeting et al. (1998) as well as items created in the HBSC study to indicate adolescents' enjoyment of participating in such activities. These items included watching TV or a video together/playing indoor games together/eating a meal together/going for a walk together/going places together/visiting friends or relatives together/playing sports together/sitting and talking about things together.

Perceived Parental Knowledge

This variable was created as a scale of a series of items taken from the instrument designed by Brown et al. (1993): "How much does your mother/father really know about…? who your friends are?/how you spend your money?/where you are after school?/where you go at night?/what you do with your free time?".

Perceived Sources of Parental Knowledge

This variable included adolescent disclosure ("In general, my mother/father knows about these things because… she/he asks me directly and I tell her/him") and parental solicitation ("In general, my mother/father knows about these things because… I tell her/him spontaneously, even if she/he doesn't ask").

Tobacco Use

This variable, which was created by the HBSC study, was devised using a numerical value to recode the weekly use of the following item (Hublet and Godeau 2005): "How often do you smoke tobacco at present?".

Alcohol Use

This item also concerns a variable that was created by the HBSC study when the initial data were collected and its use in this study includes recoding it into numerical values concerning the weekly use (Schmid et al. 2005): "Maximum frequency of current use of alcoholic beverages (beer, wine, liquor, alcopops, and others)".

Cannabis Use

This issue was taken from the *European School Survey Project on Alcohol and Other Drugs, ESPAD* (Hibell et al. 2000). The item, namely cannabis use in the last twelve

months, is as follows "Have you ever taken cannabis in the last 12 months?".

Procedures

The HBSC study indicates three basic conditions that must be met: the schoolchildren must answer the questionnaire, the anonymity of their answers must be scrupulously respected and maintained, and the questionnaires must be administered by trained interviewers within the school context (Currie et al. 2008).

To achieve the objectives of this study, correlations between variables and multiple linear regression analysis were performed using the IBM SPSS Statistics 18 program. The regression method used to select the independent variables was an 'introduction' that was performed at different stages by including the variables in different steps. The demographic variables were included first, the family dimensions were introduced second, and in the third step, the interactions of two variables, one demographic variable and one variable of family dimensions, were included. The third step analysed whether the demographic variables in this study (gender and age) had a moderating effect on the relationship between the family dimensions and substance use. Following this analysis, another multiple linear regression analysis was performed to adjust the variables related to substance use. Finally, the unstandardised residual dependant variable was kept aside to analyse the influence of parental knowledge after the effect of the other family variables had been eliminated (Hair et al. 2008a).

The statistical F test was used to analyse the significance of any increase obtained by introducing variables into the equation. The coefficient of determination R^2 was analysed to obtain the quality of the regression equation (Hair et al. 2008a). According to Cohen's recommendations (1988), the clinical relevance (R^2) was classified as negligible (0–.019), small (.02–.129), medium (.13–.259), and large (.26 and above) (Cohen 1988). The standardised beta coefficients (β) and the semi-partial correlations were analysed for each independent variable (Hair et al. 2008a).

Results

The correlation results between the family dimensions and substance use are shown in Table 1. Tobacco, alcohol, and cannabis use in adolescents were negatively related to all variables of maternal and paternal family context (except alcohol and cannabis with parental promotion of autonomy). The most significant correlations were substance use with maternal and paternal knowledge. Additionally, the maternal variables were shown to be slightly more relevant than the paternal variables.

Tobacco Use

The first multiple linear regression analysis of tobacco use with maternal variables indicated that the most relevant variables were age, gender, adolescent disclosure to mothers, and family activities. To verify this result, another multiple linear regression analysis was conducted (see Table 2), the model with non-important variables was significant, F (18, 12834) = 6.77, $p < .001$, but with a negligible clinical relevance ($\Delta R^2 = .009$). Then, the model composed of age, gender, adolescent disclosure to mothers, and family activities was significant, F (5, 12852) = 235.86, $p < .001$, with a small clinical relevance ($R^2 = .08$).

Adolescents who provided information to their mothers ($\beta = -.09$, $t = -10.38$, $p < .001$, $rs^2 = .01$) and took part in family activities ($\beta = -.07$, $t = -8.05$, $p < .001$, $rs^2 = .01$) presented lower tobacco use. Moreover, boys smoked less than girls ($\beta = -.10$, $t = -11.71$, $p < .001$, $rs^2 = .01$), and the adolescents aged 13–14 ($\beta = -.28$, $t = -26.82$, $p < .001$, $rs^2 = .05$) and those aged 15–16 ($\beta = -.15$, $t = -14.24$, $p < .001$, $rs^2 = .01$) smoked less than the 17–18 year olds.

Regression of maternal knowledge on residual tobacco use resulted in a model with a small clinical relevance ($R^2 = .02$) and significant, F (1, 12677) = 299.53, $p < .001$. Therefore, maternal knowledge was important for tobacco use.

The first multiple linear regression analysis on tobacco use with paternal variables indicated that the most relevant variables were gender, age, and family activities. To confirm the relevance of these variables, another multiple linear regression analysis was performed, as shown in Table 3. The model including gender, age, and family activities was significant, F (4, 12261) = 248.21, $p < .001$, with a small clinical relevance ($R^2 = .08$). In a second step, the remaining variables produced a significant model, F (19, 12242) = 7.67, $p < .001$, but with negligible clinical relevance ($\Delta R^2 = .01$).

Gender was an important factor in tobacco use, and boys smoked less than girls ($\beta = -.08$, $t = -9.31$, $p < .001$, $rs^2 = .01$). Regarding age, the adolescents aged 13–14 ($\beta = -.28$, $t = -25.84$, $p < .001$, $rs^2 = .05$) and those aged 15–16 ($\beta = -.15$, $t = -13.94$, $p < .001$, $rs^2 = .02$) smoked less than the 17–18 year olds. Moreover, the adolescents who took part in family activities ($\beta = -.10$, $t = -11.22$, $p < .001$, $rs^2 = .01$) used less tobacco.

The regression analysis of paternal knowledge on residual tobacco use was significant, F (1, 12102) = 103.23, $p < .001$, with negligible clinical relevance ($R^2 = .008$).

When considering maternal and paternal variables together in the same analysis, the first multiple linear regression analysis on tobacco use indicated that the most relevant variables were age, gender, and adolescent disclosure to mothers. To verify this result, another multiple linear regression analysis was conducted (see Table 4). The model

Table 1 Correlations between family dimensions and substance use

	Tobacco use	Alcohol use	Cannabis use
Maternal affection	−.10***	−.10***	−.10***
Paternal affection	−.11***	−.10***	−.10***
Maternal promotion of autonomy	−.05***	−.002	.02
Paternal promotion of autonomy	−.04***	.02*	.03***
Maternal solicitation	−.10***	−.10***	−.09***
Paternal solicitation	−.10***	−.09***	−.09***
Adolescent disclosure to mothers	−.10***	−.15***	−.13***
Adolescent disclosure to fathers	−.11***	−.12***	−.10***
Family activities	−.13***	−.13***	−.14***
Maternal knowledge	−.22***	−.22***	−.24***
Paternal knowledge	−.18***	−.15***	−.17***

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 2 Multiple linear regression analysis of tobacco use with maternal dimensions

	B	Error	β	rs^2	*p*
Model adjusted					
Boy	−0.49	0.04	−.10	.01	.000
13–14 years	−1.42	0.05	−.28	.05	.000
15–16 years	−0.72	0.05	−.15	.01	.000
Adolescent disclosure to mothers	−0.24	0.02	−.09	.01	.000
Family activities	−0.04	0.01	−.07	.01	.000
Contrast model					
Boy	−0.47	0.04	−.10	.01	.000
13–14 years	−1.45	0.05	−.28	.05	.000
15–16 years	−0.74	0.05	−.15	.01	.000
Adolescent disclosure to mothers	−0.22	0.05	−.09	.001	.000
Family activities	−0.07	0.01	−.12	.002	.000
Maternal affection	−0.08	0.12	−.01	.00	.519
Maternal promotion of autonomy	−0.32	0.11	−.06	.001	.003
Maternal solicitation	−0.12	0.06	−.04	.00	.056
Maternal affection × boy	0.18	0.12	.02	.00	.135
Maternal promotion of autonomy × boy	0.16	0.10	.02	.00	.119
Maternal solicitation × boy	−0.03	0.06	−.01	.00	.631
Adolescent disclosure to mothers × boy	0.06	0.05	.02	.00	.187
Family activities × boy	0.01	0.01	.01	.00	.593
Maternal affection × 13–14 years	−0.04	0.15	−.004	.00	.776
Maternal promotion of autonomy × 13–14 years	0.16	0.13	.02	.00	.234
Maternal solicitation × 13–14 years	0.002	0.07	.00	.00	.973
Adolescent disclosure to mothers × 13–14 years	0.02	0.06	.01	.00	.714
Family activities × 13–14 years	0.05	0.01	.06	.001	.001
Maternal affection × 15–16 years	0.06	0.15	.01	.00	.697
Maternal promotion of autonomy × 15–16 years	−0.09	0.13	−.01	.00	.468
Maternal solicitation × 15–16 years	−0.18	0.07	−.03	.00	.013
Adolescent disclosure to mothers × 15–16 years	0.00	0.06	.00	.00	.998
Family activities × 15–16 years	0.02	0.02	.02	.00	.237

Table 3 Multiple linear regression analysis of tobacco use with paternal dimensions

	B	Error	β	rs^2	*p*
Model adjusted					
Boy	−0.39	0.04	−.08	.01	.000
13–14 years	−1.40	0.05	−.28	.05	.000
15–16 years	−0.72	0.05	−.15	.02	.000
Family activities	−0.06	0.01	−.10	.01	.000
Contrast model					
Boy	−0.36	0.04	−.07	.01	.000
13–14 years	−1.41	0.06	−.28	.05	.000
15–16 years	−0.73	0.05	−.15	.01	.000
Family activities	−0.07	0.01	−.13	.003	.000
Paternal affection	−0.08	0.10	−.02	.00	.412
Paternal promotion of autonomy	−0.17	0.10	−.03	.00	.094
Paternal solicitation	−0.09	0.05	−.04	.00	.086
Adolescent disclosure to fathers	−0.05	0.06	−.02	.00	.385
Paternal affection × boy	0.14	0.10	.02	.00	.165
Paternal promotion of autonomy × boy	0.07	0.10	.01	.00	.508
Paternal solicitation × boy	0.13	0.05	.03	.00	.011
Adolescent disclosure to fathers × boy	−0.03	0.05	−.01	.00	.513
Family activities × boy	0.003	0.01	.004	.00	.784
Paternal affection × 13–14 years	−0.25	0.13	−.03	.00	.048
Paternal promotion of autonomy × 13–14 years	−0.07	0.13	−.01	.00	.597
Paternal solicitation × 13–14 years	−0.05	0.06	−.01	.00	.419
Adolescent disclosure to fathers × 13–14 years	−0.05	0.07	−.01	.00	.433
Family activities × 13–14 years	0.06	0.01	.07	.001	.000
Paternal affection × 15–16 years	0.08	0.12	.01	.00	.532
Paternal promotion of autonomy × 15–16 years	−0.03	0.12	−.004	.00	.806
Paternal solicitation × 15–16 years	−0.14	0.06	−.03	.00	.026
Adolescent disclosure to fathers × 15–16 years	−0.09	0.07	−.02	.00	.189
Family activities × 15–16 years	0.02	0.02	.03	.00	.103

with non-important variables was significant, F (35, 11931) = 6.27, $p < .001$, but with a negligible clinical relevance ($\Delta R^2 = .017$). The model composed of age, gender, and adolescent disclosure to mothers was significant, F (4, 11966) = 251.84, $p < .001$, with a small clinical relevance ($R^2 = .08$).

Boys smoked less than girls ($\beta = -.10$, $t = -11.24$, $p < .001$, $rs^2 = .01$). Additionally, adolescents aged 13–14 ($\beta = -.29$, $t = -26.72$, $p < .001$, $rs^2 = .06$) and those aged 15–16 ($\beta = -.15$, $t = -13.93$, $p < .001$, $rs^2 = .02$) smoked less than the 17–18 year olds. Finally, the adolescents who disclosed to information to their mothers ($\beta = -.12$, $t = -13.07$, $p < .001$, $rs^2 = .01$) used less tobacco.

Regression of the factors maternal and paternal knowledge on residual tobacco use was significant, F (2, 11746) = 133.07, $p < .001$, with a small clinical relevance ($R^2 = .02$). Paternal knowledge was not a significant dimension ($\beta = -.002, t = -0.19, p = .850$), but maternal knowledge was important for lower tobacco use ($\beta = -.15$, $t = -12.74$, $p < .001$, $rs^2 = .01$).

Alcohol Use

Age and adolescent disclosure were the most relevant variables in the multiple linear regression analysis on alcohol use with maternal variables. Another multiple linear regression analysis was conducted to confirm the importance of these variables, as shown in Table 5. The model with age and adolescent disclosure was significant, F (3, 12695) = 705.25, $p < .001$, with a medium clinical relevance ($R^2 = .14$). The model with variables that did not have a specific contribution was significant, F (20, 12675) = 7.27, $p < .001$, but with negligible clinical relevance ($\Delta R^2 = .01$).

Age was particularly relevant. The adolescents aged 13–14 ($\beta = -.42$, $t = -42.22$, $p < .001$, $rs^2 = .12$) and those aged 15–16 ($\beta = -.19$, $t = -18.98$, $p < .001$,

Table 4 Multiple linear regression analysis of tobacco use with maternal and paternal dimensions

	B	Error	β	rs^2	*p*
Model adjusted					
Boy	−0.48	0.04	−.10	.01	.000
13–14 years	−1.45	0.05	−.29	.06	.000
15–16 years	−0.73	0.05	−.15	.02	.000
Adolescent disclosure to mothers	−0.29	0.02	−.12	.01	.000
Contrast model					
Boy	−0.43	0.04	−.09	.01	.000
13–14 years	−1.42	0.06	−.28	.05	.000
15–16 years	−0.75	0.05	−.15	.02	.000
Adolescent disclosure to mothers	−0.22	0.06	−.09	.001	.000
Maternal affection	0.08	0.14	.01	.00	.594
Paternal affection	−0.20	0.12	−.04	.00	.083
Maternal promotion of autonomy	−0.39	0.13	−.07	.001	.002
Paternal promotion of autonomy	−0.02	0.12	−.003	.00	.888
Maternal solicitation	−0.05	0.07	−.02	.00	.437
Paternal solicitation	−0.09	0.06	−.03	.00	.120
Adolescent disclosure to fathers	0.06	0.07	.03	.00	.328
Family activities	−0.06	0.01	−.10	.001	.000
Maternal affection × boy	0.13	0.14	.01	.00	.368
Paternal affection × boy	0.12	0.11	.02	.00	.274
Maternal promotion of autonomy × boy	0.18	0.13	.02	.00	.154
Paternal promotion of autonomy × boy	−0.01	0.12	−.002	.00	.912
Maternal solicitation × boy	−0.09	0.06	−.02	.00	.153
Paternal solicitation × boy	0.17	0.06	.04	.001	.003
Adolescent disclosure to mothers × boy	0.03	0.06	.01	.00	.562
Adolescent disclosure to fathers × boy	0.003	0.06	.001	.00	.961
Family activities × boy	−0.01	0.01	−.01	.00	.485
Maternal affection × 13–14 years	−0.04	0.18	−.004	.00	.809
Paternal affection × 13–14 years	−0.19	0.15	−.02	.00	.199
Maternal promotion of autonomy × 13–14 years	0.37	0.16	.04	.00	.021
Paternal promotion of autonomy × 13–14 years	−0.24	0.15	−.02	.00	.115
Maternal solicitation × 13–14 years	0.02	0.08	.003	.00	.837
Paternal solicitation × 13–14 years	−0.05	0.07	−.01	.00	.518
Adolescent disclosure to mothers × 13–14 years	0.05	0.07	.01	.00	.479
Adolescent disclosure to fathers × 13–14 years	−0.10	0.08	−.02	.00	.198
Family activities × 13–14 years	0.06	0.02	.07	.001	.000
Maternal affection × 15–16 years	−0.10	0.17	−.01	.00	.542
Paternal affection × 15–16 years	0.15	0.14	.02	.00	.261
Maternal promotion of autonomy × 15–16 years	−0.02	0.15	−.002	.00	.909
Paternal promotion of autonomy × 15–16 years	0.02	0.14	.002	.00	.918
Maternal solicitation × 15–16 years	−0.16	0.08	−.03	.00	.039
Paternal solicitation × 15–16 years	−0.08	0.07	−.02	.00	.244
Adolescent disclosure to mothers × 15–16 years	0.04	0.07	.01	.00	.611
Adolescent disclosure to fathers × 15–16 years	−0.11	0.08	−.03	.00	.141
Family activities × 15–16 years	0.03	0.02	.03	.00	.074

$rs^2 = .02$) drank less alcohol than the 17–18 year olds. Additionally, the adolescents drank less alcohol when they provided their mothers with information ($\beta = -.14$, $t = -16.96$, $p < .001$, $rs^2 = .02$).

The regression analysis of maternal knowledge on residual alcohol use was significant, F (1, 12520) = 274.42, $p < .001$, and it had a small clinical relevance ($R^2 = .02$). Therefore, maternal knowledge was an important factor for alcohol use.

The first multiple linear regression analysis on alcohol use with the paternal variables indicated that the most relevant variables were age and adolescent disclosure. To confirm the relevance of these variables, another multiple linear regression analysis was performed (see Table 6). The model that included age and adolescent disclosure was significant, F (3, 12119) = 647.31, $p < .001$, with medium clinical relevance ($R^2 = .14$). On the contrary, the second model with non-important variables was significant, F (20, 12099) = 5.60, $p < .001$, but with negligible clinical relevance ($\Delta R^2 = .008$).

Again, age was a decisive factor, and the adolescents aged 13–14 ($\beta = -.42$, $t = -41.06$, $p < .001$, $rs^2 = .12$) and those aged 15–16 ($\beta = -.19$, $t = -18.65$, $p < .001$, $rs^2 = .02$) drank less alcohol than the 17–18 year old. Additionally, adolescent disclosure to the father ($\beta = -.11$, $t = -12.91$, $p < .001$, $rs^2 = .01$) led to lower alcohol use.

Regression of paternal knowledge on residual alcohol use was significant, F (1, 11962) = 73.69, $p < .001$, but with a negligible clinical relevance ($R^2 = .006$).

Taking the maternal and paternal variables into consideration together in the same analysis (see Table 7), the first multiple linear regression analysis on alcohol use indicated that the most relevant variables were age and adolescent disclosure to mothers. To verify the relevance of these variables, another multiple linear regression analysis was conducted. The model composed of age and adolescent disclosure to

Table 5 Multiple linear regression analysis of alcohol use with maternal dimensions

	B	Error	β	rs^2	*p*
Model adjusted					
13–14 years	−1.33	0.03	−.42	.12	.000
15–16 years	−0.57	0.03	−.19	.02	.000
Adolescent disclosure to mothers	−0.22	0.01	−.14	.02	.000
Contrast model					
13–14 years	−1.30	0.03	−.41	.11	.000
15–16 years	−0.57	0.03	−.19	.02	.000
Adolescent disclosure to mothers	−0.26	0.03	−.17	.01	.000
Boy	0.08	0.03	.03	.001	.002
Maternal affection	−0.06	0.07	−.02	.00	.426
Maternal promotion of autonomy	0.05	0.06	.02	.00	.426
Maternal solicitation	−0.11	0.04	−.06	.001	.003
Family activities	−0.02	0.01	−.05	.00	.024
Maternal affection × boy	0.21	0.07	.04	.001	.003
Maternal promotion of autonomy × boy	−0.12	0.06	−.02	.00	.060
Maternal solicitation × boy	−0.13	0.03	−.04	.001	.000
Adolescent disclosure to mothers × boy	−0.04	0.03	−.02	.00	.192
Family activities × boy	0.002	0.01	.004	.00	.728
Maternal affection × 13–14 years	−0.10	0.09	−.01	.00	.303
Maternal promotion of autonomy × 13–14 years	0.07	0.08	.01	.00	.403
Maternal solicitation × 13–14 years	0.15	0.04	.04	.001	.001
Adolescent disclosure to mothers × 13–14 years	0.18	0.04	.07	.002	.000
Family activities × 13–14 years	−0.001	0.01	−.001	.00	.948
Maternal affection × 15–16 years	−0.04	0.09	−.01	.00	.656
Maternal promotion of autonomy × 15–16 years	−0.06	0.08	−.01	.00	.465
Maternal solicitation × 15–16 years	0.03	0.04	.01	.00	.466
Adolescent disclosure to mothers × 15–16 years	0.11	0.04	.05	.001	.001
Family activities × 15–16 years	0.01	0.01	.01	.00	.512

Table 6 Multiple linear regression analysis of alcohol use with paternal dimensions

	B	Error	β	rs^2	*p*
Model adjusted					
13–14 years	−1.33	0.03	−.42	.12	.000
15–16 years	−0.58	0.03	−.19	.02	.000
Adolescent disclosure to fathers	−0.17	0.01	−.11	.01	.000
Contrast model					
13–14 years	−1.30	0.03	−.41	.11	.000
15–16 years	−0.56	0.03	−.19	.02	.000
Adolescent disclosure to fathers	−0.19	0.03	−.12	.002	.000
Boy	0.15	0.03	.05	.003	.000
Paternal affection	−0.05	0.06	−.02	.00	.379
Paternal promotion of autonomy	0.12	0.06	.04	.00	.044
Paternal solicitation	−0.01	0.03	−.01	.00	.767
Family activities	−0.02	0.01	−.06	.001	.006
Paternal affection × boy	0.03	0.06	.01	.00	.648
Paternal promotion of autonomy × boy	0.04	0.06	.01	.00	.515
Paternal solicitation × boy	−0.01	0.03	−.003	.00	.828
Adolescent disclosure to fathers × boy	−0.05	0.03	−.02	.00	.138
Family activities × boy	0.002	0.01	.01	.00	.716
Paternal affection × 13–14 years	0.10	0.08	.02	.00	.192
Paternal promotion of autonomy × 13–14 years	−0.19	0.08	−.03	.00	.018
Paternal solicitation × 13–14 years	−0.05	0.04	−.02	.00	.222
Adolescent disclosure to fathers × 13–14 years	0.09	0.04	.04	.00	.022
Family activities × 13–14 years	0.004	0.01	.01	.00	.603
Paternal affection × 15–16 years	0.09	0.07	.02	.00	.199
Paternal promotion of autonomy × 15–16 years	−0.18	0.07	−.03	.00	.016
Paternal solicitation × 15–16 years	−0.07	0.04	−.03	.00	.046
Adolescent disclosure to fathers × 15–16 years	0.11	0.04	.04	.001	.006
Family activities × 15–16 years	−0.002	0.01	−.003	.00	.839

mothers was significant, F (3, 11822) = 676.01, $p < .001$, with medium clinical relevance ($R^2 = .15$). The remaining variables produced a significant model, F (36, 11786) = 5.02, $p < .001$, but with a negligible clinical relevance ($\Delta R^2 = .01$).

Adolescents aged 13–14 ($\beta = -.42$, $t = -41.29$, $p < .001$, $rs^2 = .12$) and those aged 15–16 ($\beta = -.19$, $t = -18.84$, $p < .001$, $rs^2 = .03$) scored lower for alcohol use than adolescents aged 17–18 years old. Moreover, the adolescents with high disclosure to mothers ($\beta = -.14$, $t = -16.72$, $p < .001$, $rs^2 = .02$) used less alcohol.

The regression analysis of maternal and paternal knowledge on residual alcohol use was significant, F (2, 11606) = 124.01, $p < .001$, with a small clinical relevance ($R^2 = .02$). Maternal knowledge was the only relevant dimension ($\beta = -.16$, $t = -13.52$, $p < .001$, $rs^2 = .02$), and paternal knowledge was not significant ($\beta = .02$, $t = 1.92$, $p = .055$).

Cannabis Use

Age, adolescent disclosure, and family activities were the most relevant variables in the first multiple linear regression analysis on cannabis use with the maternal variables. Another multiple linear regression analysis was conducted to confirm the importance of these variables, as shown in Table 8. The model that included age, adolescent disclosure to mothers, and family activities was significant, F (4, 12782) = 254.42, $p < .001$, with small clinical relevance ($R^2 = .07$). Additionally, the addition of variables without a specific contribution was significant, F (19, 12763) = 9.13, $p < .001$, but with negligible clinical relevance ($\Delta R^2 = .01$).

The adolescents aged 13–14 years ($\beta = -.27$, $t = -25.41$, $p < .001$, $rs^2 = .05$) and those aged 15–16 years ($\beta = -.14$, $t = -12.98$, $p < .001$, $rs^2 = .01$) used less cannabis than those aged 17–18 years. Moreover,

Table 7 Multiple linear regression analysis of alcohol use with maternal and paternal dimensions

	B	Error	β	rs^2	*p*
Model adjusted					
13–14 years	−1.35	0.03	−.42	.12	.000
15–16 years	−0.59	0.03	−.19	.03	.000
Adolescent disclosure to mothers	−0.22	0.01	−.14	.02	.000
Contrast model					
13–14 years	−1.31	0.03	−.41	.11	.000
15–16 years	−0.57	0.03	−.19	.02	.000
Adolescent disclosure to mothers	−0.21	0.04	−.13	.002	.000
Boy	0.09	0.03	.03	.001	.000
Maternal affection	−0.06	0.09	−.02	.00	.465
Paternal affection	−0.09	0.07	−.03	.00	.173
Maternal promotion of autonomy	−0.003	0.08	−.001	.00	.967
Paternal promotion of autonomy	0.14	0.07	.04	.00	.056
Maternal solicitation	−0.13	0.04	−.06	.001	.002
Paternal solicitation	0.04	0.03	.02	.00	.262
Adolescent disclosure to fathers	−0.08	0.04	−.05	.00	.035
Family activities	−0.01	0.01	−.04	.00	.127
Maternal affection × boy	0.27	0.08	.05	.001	.001
Paternal affection × boy	−0.09	0.07	−.02	.00	.208
Maternal promotion of autonomy × boy	−0.17	0.08	−.03	.00	.023
Paternal promotion of autonomy × boy	0.10	0.07	.02	.00	.163
Maternal solicitation × boy	−0.13	0.04	−.04	.001	.001
Paternal solicitation × boy	0.03	0.03	.01	.00	.328
Adolescent disclosure to mothers × boy	−0.06	0.04	−.03	.00	.114
Adolescent disclosure to fathers × boy	0.03	0.04	.01	.00	.451
Family activities × boy	0.001	0.01	.002	.00	.903
Maternal affection × 13–14 years	−0.18	0.11	−.03	.00	.094
Paternal affection × 13–14 years	0.22	0.09	.04	.00	.013
Maternal promotion of autonomy × 13–14 years	0.23	0.10	.04	.00	.017
Paternal promotion of autonomy × 13–14 years	−0.31	0.09	−.05	.001	.001
Maternal solicitation × 13–14 years	0.20	0.05	.06	.001	.000
Paternal solicitation × 13–14 years	−0.11	0.04	−.04	.00	.010
Adolescent disclosure to mothers × 13–14 years	0.17	0.04	.06	.001	.000
Adolescent disclosure to fathers × 13–14 years	−0.004	0.05	−.001	.00	.940
Family activities × 13–14 years	−0.001	0.01	−.002	.00	.901
Maternal affection × 15–16 years	−0.07	0.10	−.01	.00	.504
Paternal affection × 15–16 years	0.15	0.08	.03	.00	.061
Maternal promotion of autonomy × 15–16 years	0.01	0.09	.001	.00	.953
Paternal promotion of autonomy × 15–16 years	−0.19	0.09	−.04	.00	.031
Maternal solicitation × 15–16 years	0.06	0.05	.02	.00	.217
Paternal solicitation × 15–16 years	−0.10	0.04	−.04	.00	.010
Adolescent disclosure to mothers × 15–16 years	0.07	0.04	.03	.00	.105
Adolescent disclosure to fathers × 15–16 years	0.06	0.05	.03	.00	.166
Family activities × 15–16 years	0.002	0.01	.004	.00	.815

adolescents who took part in family activities ($\beta = -.08$, $t = -8.86$, $p < .001$, $rs^2 = .01$) and provided their mothers with information ($\beta = -.10$, $t = -10.84$, $p < .001$, $rs^2 = .01$) used less cannabis.

The regression analysis of maternal knowledge on residual cannabis use was significant, F (1, 12607) = 344.69, $p < .001$, and with a small clinical relevance ($R^2 = .03$). Maternal knowledge was decisive for cannabis use.

Table 8 Multiple linear regression analysis of cannabis use with maternal dimensions

	B	Error	β	rs^2	*p*
Model adjusted					
13–14 years	−5.45	0.21	−.27	.05	.000
15–16 years	−2.66	0.21	−.14	.01	.000
Adolescent disclosure to mothers	−0.98	0.09	−.09	.01	.000
Family activities	−0.18	0.02	−.08	.01	.000
Contrast model					
13–14 years	−5.27	0.22	−.26	.04	.000
15–16 years	−2.46	0.21	−.12	.01	.000
Adolescent disclosure to mothers	−1.78	0.21	−.18	.01	.000
Family activities	−0.35	0.05	−.15	.003	.000
Boy	0.30	0.17	.02	.00	.078
Maternal affection	−0.25	0.50	−.01	.00	.621
Maternal promotion of autonomy	1.42	0.44	.06	.001	.001
Maternal solicitation	−0.39	0.25	−.03	.00	.113
Maternal affection × boy	0.98	0.48	.03	.00	.042
Maternal promotion of autonomy × boy	0.55	0.41	.02	.00	.181
Maternal solicitation × boy	−0.23	0.23	−.01	.00	.321
Adolescent disclosure to mothers × boy	0.19	0.19	.01	.00	.323
Family activities × boy	−0.06	0.04	−.02	.00	.161
Maternal affection × 13–14 years	−0.88	0.63	−.02	.00	.160
Maternal promotion of autonomy × 13–14 years	−1.21	0.54	−.03	.00	.025
Maternal solicitation × 13–14 years	0.27	0.30	.01	.00	.369
Adolescent disclosure to mothers × 13–14 years	1.35	0.25	.08	.002	.000
Family activities × 13–14 years	0.33	0.06	.10	.002	.000
Maternal affection × 15–16 years	−1.36	0.59	−.04	.00	.022
Maternal promotion of autonomy × 15–16 years	−0.99	0.51	−.03	.00	.054
Maternal solicitation × 15–16 years	−0.40	0.29	−.02	.00	.168
Adolescent disclosure to mothers × 15–16 years	0.80	0.24	.05	.001	.001
Family activities × 15–16 years	0.20	0.06	.05	.001	.001

The first multiple linear regression analysis on cannabis use with the paternal variables indicated that the most relevant variables were age and family activities. To verify the relevance of these variables, another multiple linear regression analysis was performed (see Table 9). The model of age and family activities was significant, $F\,(3, 12206) = 276.79$, $p < .001$, with a small clinical relevance ($R^2 = .06$). In a second step, the remaining variables produced a significant model, $F\,(20, 12186) = 10.21, p < .001$, but with negligible clinical relevance ($\Delta R^2 = .01$).

Adolescents aged 13–14 years ($\beta = -.26$, $t = -23.99$, $p < .001$, $rs^2 = .04$) and those aged 15–16 years ($\beta = -.13$, $t = -12.31$, $p < .001$, $rs^2 = .01$) used less cannabis than those aged 17–18 years. Additionally, taking part in family activities ($\beta = -.11$, $t = -12.51$, $p < .001$, $rs^2 = .01$) was associated with less use of cannabis.

Regression of paternal knowledge on residual cannabis use was significant, $F\,(1, 12045) = 97.79, p < .001$, with a negligible clinical relevance ($R^2 = .008$).

Considering maternal and paternal variables simultaneously in the same analysis (see Table 10), the first multiple linear regression analysis on cannabis use indicated that the most relevant variables were age, adolescent disclosure to mothers, and participation in family activities. To confirm this result, another multiple linear regression analysis was conducted, and the model with non-important variables was significant, $F\,(35, 11880) = 6.80, p < .001$, but with a negligible clinical relevance ($\Delta R^2 = .018$). Finally, the model composed of age, adolescent disclosure to mothers, and family activities was significant, $F\,(4, 11915) = 235.32, p < .001$, with a small clinical relevance ($R^2 = .07$).

Adolescents aged 13–14 ($\beta = -.27$, $t = -24.39$, $p < .001$, $rs^2 = .05$) and those aged 15–16 ($\beta = -.14$, $t = -12.64$, $p < .001$, $rs^2 = .01$) used less cannabis than adolescents aged 17–18 years old. Moreover, the adolescents who disclosed to their mothers ($\beta = -.10$, $t = -10.75$, $p < .001$, $rs^2 = .01$) and those who took part in

Table 9 Multiple linear regression analysis of cannabis use with paternal dimensions

	B	Error	β	rs^2	*p*
Model adjusted					
13–14 years	−5.29	0.22	−.26	.04	.000
15–16 years	−2.59	0.21	−.13	.01	.000
Family activities	−0.25	0.02	−.11	.01	.000
Contrast model					
13–14 years	−5.04	0.23	−.25	.04	.000
15–16 years	−2.29	0.22	−.12	.01	.000
Family activities	−0.41	0.05	−.18	.01	.000
Boy	0.74	0.17	.04	.001	.000
Paternal affection	−0.45	0.42	−.02	.00	.282
Paternal promotion of autonomy	2.11	0.42	.10	.002	.000
Paternal solicitation	−0.77	0.21	−.07	.001	.000
Adolescent disclosure to fathers	−0.47	0.22	−.05	.00	.035
Paternal affection × boy	0.65	0.40	.02	.00	.107
Paternal promotion of autonomy × boy	0.44	0.41	.01	.00	.279
Paternal solicitation × boy	0.59	0.20	.04	.001	.004
Adolescent disclosure to fathers × boy	−0.49	0.21	−.03	.00	.017
Family activities × boy	−0.02	0.04	−.01	.00	.587
Paternal affection × 13–14 years	−0.18	0.52	−.01	.00	.735
Paternal promotion of autonomy × 13–14 years	−2.34	0.53	−.06	.001	.000
Paternal solicitation × 13–14 years	0.13	0.26	.01	.00	.618
Adolescent disclosure to fathers × 13–14 years	0.38	0.27	.02	.00	.151
Family activities × 13–14 years	0.38	0.06	.11	.003	.000
Paternal affection × 15–16 years	−0.09	0.49	−.003	.00	.857
Paternal promotion of autonomy × 15–16 years	−2.06	0.50	−.06	.001	.000
Paternal solicitation × 15–16 years	−0.09	0.25	−.01	.00	.721
Adolescent disclosure to fathers × 15–16 years	0.25	0.26	.02	.00	.352
Family activities × 15–16 years	0.21	0.06	.05	.001	.001

family activities ($\beta = -.08$, $t = -8.22$, $p < .001$, $rs^2 = .01$) scored lower in cannabis use.

The regression analysis of maternal and paternal knowledge on residual cannabis use was significant, F (2, 11696) = 152.82, $p < .001$, with a small clinical relevance ($R^2 = .03$). Paternal knowledge was not a significant dimension ($\beta = .01$, $t = 1.18$, $p = .240$), but maternal knowledge was important for lower cannabis use ($\beta = -.17$, $t = -14.48$, $p < .001$, $rs^2 = .02$).

Discussion

The main objective of this study was to identify the most important family dimensions related to the most commonly used substances by adolescents, specifically tobacco, alcohol, and cannabis, and to analyse the influence of the demographic variables (gender and age of adolescents).

The results have shown that not all the family dimensions were relevant for substance use; only parental knowledge, adolescent disclosure, and family activities were associated with a lower substance use.

Regarding the effects of parental knowledge on tobacco, alcohol, and cannabis use that could not be explained by the other family dimensions (after removal the influence of these family dimensions: parental affection, parental promotion of autonomy, adolescent disclosure, parental solicitation, and family activities), only maternal knowledge was important, despite the fact that in the correlations, the dimensions of paternal and maternal knowledge were the most related to substance use.

The results showed that the influence of maternal knowledge was normally greater than that of paternal knowledge, and it was particularly influential on substance use. Furthermore, the data showed that maternal knowledge was associated with tobacco, alcohol, and cannabis use after having eliminated the influence of family dimensions on substance use. In turn these family dimensions (concretely, adolescent disclosure, parental affection, parental solicitation, and family activities) have an

Table 10 Multiple linear regression analysis of cannabis use with maternal and paternal dimensions

	B	Error	β	rs^2	*p*
Model adjusted					
13–14 years	−5.42	0.22	−.27	.05	.000
15–16 years	−2.68	0.21	−.14	.01	.000
Adolescent disclosure to mothers	−1.01	0.09	−.10	.01	.000
Family activities	−0.18	0.02	−.08	.01	.000
Contrast model					
13–14 years	−5.10	0.23	−.25	.04	.000
15–16 years	−2.39	0.22	−.12	.01	.000
Adolescent disclosure to mothers	−1.96	0.25	−.19	.01	.000
Family activities	−0.33	0.06	−.15	.003	.000
Boys	0.42	0.18	.02	.00	.017
Maternal affection	1.15	0.58	.05	.00	.046
Paternal affection	−1.45	0.47	−.08	.001	.002
Maternal promotion of autonomy	0.26	0.52	.01	.00	.623
Paternal promotion of autonomy	1.97	0.49	.09	.001	.000
Maternal solicitation	−0.01	0.27	.00	.00	.984
Paternal solicitation	−0.84	0.23	−.08	.001	.000
Adolescent disclosure to fathers	0.58	0.27	.06	.00	.029
Maternal affection × boy	0.75	0.56	.02	.00	.186
Paternal affection × boy	0.53	0.46	.02	.00	.244
Maternal promotion of autonomy × boy	0.79	0.51	.02	.00	.118
Paternal promotion of autonomy × boy	−0.11	0.49	−.003	.00	.817
Maternal solicitation × boy	−0.69	0.26	−.04	.001	.007
Paternal solicitation × boy	0.86	0.22	.06	.001	.000
Adolescent disclosure to mothers × boy	0.22	0.24	.02	.00	.358
Adolescent disclosure to fathers × boy	−0.41	0.25	−.03	.00	.100
Family activities × boy	−0.07	0.05	−.02	.00	.113
Maternal affection × 13–14 years	−2.15	0.72	−.05	.001	.003
Paternal affection × 13–14 years	0.96	0.59	.03	.00	.103
Maternal promotion of autonomy × 13–14 years	0.15	0.65	.004	.00	.822
Paternal promotion of autonomy × 13–14 years	−2.38	0.62	−.06	.001	.000
Maternal solicitation × 13–14 years	0.30	0.33	.01	.00	.373
Paternal solicitation × 13–14 years	0.11	0.28	.01	.00	.690
Adolescent disclosure to mothers × 13–14 years	1.62	0.30	.10	.002	.000
Adolescent disclosure to fathers × 13–14 years	−0.58	0.32	−.04	.00	.068
Family activities × 13–14 years	0.34	0.06	.10	.002	.000
Maternal affection × 15–16 years	−2.5	0.69	−.07	.001	.000
Paternal affection × 15–16 years	1.12	0.56	.04	.00	.044
Maternal promotion of autonomy × 15–16 years	−0.002	0.62	.00	.00	.998
Paternal promotion of autonomy × 15−16 years	−2.03	0.58	−.06	.001	.000
Maternal solicitation × 15–16 years	−0.56	0.32	−.03	.00	.079
Paternal solicitation × 15–16 years	0.12	0.27	.01	.00	.656
Adolescent disclosure to mothers × 15–16 years	0.98	0.29	.06	.001	.001
Adolescent disclosure to fathers × 15–16 years	−0.40	0.31	−.03	.00	.199
Family activities × 15–16 years	0.22	0.06	.06	.001	.001

influence on parental knowledge (Jiménez-Iglesias et al. 2013). It is possible that this knowledge must be obtained by other means (as well as through disclosure, affection, solicitation, and time shared together), such as spying, listening in, or obtaining information from other people (not analysed in this study) to be effective, as it is more

difficult for parents to obtain information from their adolescents if they are using substances (Laird et al. 2003).

Parental knowledge is effective aspect of protecting adolescents from substance use (Piko and Kovács 2010). However, knowledge is not a fully protective factor on its own. Parents must use their knowledge to protect their adolescents (Stattin et al. 2010). In our study, the parents must have effectively used their knowledge because parental knowledge was associated with lower substance use. Furthermore, family dimensions (parent–child relationships that are affectionate, close, and communicative) that promote parental knowledge, favour the efficacy of knowledge.

During adolescence, a period in which opportunities to take part in problematic activities increase while direct parental supervision decreases, parental knowledge has a greater relevance because it allows parents to be informed about the lives of their adolescents (Jacobson and Crockett 2000). In this way, parental knowledge is important to decrease substance use in adolescents, as found in this and other studies (Coley et al. 2008; Jiménez-Iglesias et al. 2012a; Li et al. 2000a, b; Rai et al. 2003; Richards et al. 2004; Soenens et al. 2006; Tebes et al. 2011).

Adolescents' disclosure to their parents was another important family dimension for alcohol use, and only disclosure to mothers had an effect on tobacco and cannabis use. Disclosure to mothers also had an effect on alcohol use when maternal and paternal dimensions were analysed simultaneously (most likely because of disclosure to mothers is usually more frequent).

When adolescents give information to their parents, parents are more likely to trust their children to make the right decisions (Kerr et al. 1999). Moreover, due to adolescent disclosure, parents can guide the decisions, behaviours, etc. of their children and prevent them from engaging in risky behaviours, and cause them to consider the negative consequences of these behaviours (Marshall et al. 2005). Therefore, the more that the adolescents tell their parents, the less chance there is that the adolescents will use substances (Engels et al. 2005; Ghandour 2009; Jiménez-Iglesias et al. 2012a; Keijsers et al. 2010; Stavrinides et al. 2010).

Therefore, adolescent disclosure to parents could be considered the best strategy to prevent problems during adolescence (Oliva et al. 2007). Although disclosure is an adolescent's behaviour, parents can contribute by encouraging their adolescents trust them and to disclose information about their lives that would not otherwise be accessible. Parents who listen to their adolescents with an open mind when they speak and avoid reacting negatively to their comments make it more likely that adolescent disclosure will occur (Hayes et al. 2003, 2004; Tilton-Weaver et al. 2010).

In the case of both parental knowledge and adolescent disclosure, the results indicate than maternal dimensions have a greater influence on a lower substance use than paternal dimensions, which show that although both parents are important for adolescents, the maternal influence is higher than the paternal influence (Hair et al. 2008b). This most likely because of disclosure to mothers and maternal knowledge are typically more frequent.

Adolescents perceive the communication with their mothers to be easier than with their fathers (Moreno et al. 2011; Tabak et al. 2012), so they talk and disclose more information to their mothers (Oliva et al. 2007). The higher level of communication with mothers could be because mothers are more involved in the daily lives of their adolescents and they may talk more with them, which makes it easier for adolescents to feel more comfortable with their mothers (Yau et al. 2009). Furthermore, mothers may know better how meet the needs of adolescents (Maccoby 2003). In fact, research has shown that mothers spend more time with their adolescents (Dubas and Gerris 2002; Hawkins et al. 2006). When times are spent together, adolescent disclosure and parental solicitation are more likely to occur (Keijsers et al. 2010). Both dimensions, adolescent disclosure and parental solicitation, are important ways of obtaining knowledge, and they are usually used by mothers. Therefore, these dimensions also explain why mothers have more knowledge about their children than fathers (Crouter et al. 2005; Waizenhofer et al. 2004). The greater occurrence of disclosure to mothers and the increased maternal knowledge allow mothers have more information about their adolescents and more effectively promote responsible substance use by adolescents.

Participation in family activities specifically was associated with less tobacco and cannabis use by adolescents. Time shared with family protects adolescents from substance use (Coley et al. 2008; Secades-Villa et al. 2005; Sweeting et al. 1998). During family activities, family members can transmit attitudes, values, opinions, etc., that are likely to oppose substance use. Furthermore, if adolescents perceive a positive family climate during family activities, the protective effect of these activities on substance use will increase (White and Halliwell 2010).

Therefore, the most important family dimensions for substance use were adolescent disclosure, participation in family activities (mainly for tobacco and cannabis use), and especially parental knowledge. However, when the significance of family dimensions of this study on well-being was analysed, the most relevant family dimensions were family activities (as for substance use), parental promotion of autonomy, and especially parental affection (Jiménez-Iglesias et al. 2012b).

On the other hand, the demographic variables in this study (gender and age) did not have a moderating effect on

the relationship between the family dimensions and substance use (that is, neither age nor sex influenced the relationship between family dimensions and substance use), but individually they were associated with adolescents' substance use, as shown in previous studies.

Age-related differences were particularly significant with regard to adolescents' substance use. The younger adolescents (aged 13–14 and 15–16 years old) used less tobacco, alcohol, and cannabis (Currie et al. 2008; Delegación del Gobierno para el Plan Nacional sobre Drogas 2009; Moreno et al. 2011) than the older adolescents (aged 17–18 years old). Therefore, during adolescence, substance use seems to follow an upward trajectory, where adolescents begin experimenting with tobacco, alcohol, and cannabis, leading to greater substance use (Kandel and Jessor 2002; Simões et al. 2012). Furthermore, the use of these substances makes the use of another substances easier (Duncan et al. 1998).

On the contrary, no gender-related differences were found in substance use among adolescents with the exception of tobacco, for which girls were found to smoke more than boys, which is consistent with previous studies (Delegación del Gobierno para el Plan Nacional sobre Drogas 2009; Hibell et al. 2009; Moreno et al. 2011). The lack of gender-related differences in the use of alcohol (Delegación del Gobierno para el Plan Nacional sobre Drogas 2009) and cannabis (Currie et al. 2008) observed in this study has previously been highlighted in other studies. Perhaps this is because substance use among girls is increasing rapidly (Moreno et al. 2011) and has been shown to equal that of boys with the highest consumption (Simons-Morton et al. 2009). Moreover, attitudinal differences between boys and girls must also be considered. Although, boys have a favourable aptitude to use substances, especially illegal substances and alcohol while girls show more resistance to substance use and a greater awareness of substance use problems, girls have lower risk perceptions, greater curiosity, and a greater desire to experiment with legal substances, such as alcohol and tobacco (Moral Jiménez et al. 2011).

Some limitations must be considered. The cross-sectional design has more limited validity than a longitudinal design. A cross-sectional design does not allow the identification of causality relationships or knowledge of the direction of the relationships between the variables. In this research, the influence of parents on adolescents' substance use was analysed, but the direction of the relationship cannot be determined. Parents who are able to influence their children also show a willingness to be influenced by their children (Maccoby 2003). Additionally, parental and adolescent influences are inseparable as these relationships are continuously dynamic. It can be difficult to know who influenced first or how much (Shanahan and Sobolewski 2003).

The fact that all the information in this study comes from one source, namely, male and female adolescents, may result in exaggeration of the relationships between the different variables and reveal only the adolescents' perceptions of parental behaviour. However, adolescents are the most reliable, objective source of information and are least influenced by social desirability (Parra and Oliva 2006). Furthermore, their ideas about adolescence are more positive and consistent with the results of the current research than parents' ideas (Ridao and Moreno 2008). Finally, their perception of the parental message determines the efficacy of parental socialisation (Grusec and Goodnow 1994).

Another weakness of this study is the fact that the explained variance of the regression analysis was not sufficiently high, possibly because, from a systematic-ecological point of view that considers multiple contexts of influence (Bronfrenbrenner 1979), only the family context has been taken into consideration. In fact, in our qualitative study in which adolescents were asked about the influences of different variables on their substance use, they stated that their friends have a greater effect than their own relatives (Jiménez-Iglesias 2011). Relationships with peers during adolescence have a greater relevance (Brown 2004; Rubin et al. 2006) and the peer group represents an important determinant of adolescents' substance use (Bahr et al. 2005; Ramos et al. 2011; Sánchez-Queija et al. 2007; Windle 2000). Nevertheless, positive parental practices promote desirable behavioural patterns and associations with prosocial peer groups (Brown et al. 1993; Goldstein et al. 2005; Mounts 2008).

The greatest strength of this study is that the HBSC study provides a well-rounded view of family and adolescents, and the sampling favoured the generalisation of the results.

Therefore, this study has provided additional information about the dimensions of the family associated with responsible tobacco, alcohol, and cannabis use in adolescents, taking into account the gender and age differences. This is a particularly important area for current research in developmental psychology (Kerr et al. 2008). Furthermore, interventions should be conducted in the main contexts of development, such as family context, with the objective of preventing problems and promoting health and well-being in these contexts (Stattin and Kerr 2009). In fact, working with families is an effective way to reduce substance use (Koutakis et al. 2008), and this study proposes which family dimensions (adolescent disclosure, family activities, and parental knowledge) should be especially considered when intervening in adolescents' substance use.

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References

Bahr, S. J., Hoffmann, J. P., & Yang, X. (2005). Parental and peer influences on the risk of adolescent drug use. *The Journal of Primary Prevention, 26*, 529–551. doi:10.1007/s10935-005-0014-8.

Barnes, G. M., Hoffman, J. H., Welte, J. W., Farrell, M. P., & Dintcheff, B. A. (2006). Effects of parental monitoring and peer deviance on substance use and delinquency. *Journal of Marriage and the Family, 68*, 1084–1104. doi:10.1111/j.1741-3737.2006.00315.x.

Bronfrenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Brown, B. B. (2004). Adolescents' relationships with peers. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed., pp. 363–394). New Jersey, NJ: Wiley.

Brown, B. B., Mounts, N., Lamborn, S. D., & Steinberg, L. (1993). Parenting practices and peer group affiliation in adolescence. *Child Development, 64*, 467–482. doi:10.1111/j.1467-8624.1993.tb02922.x.

Bumpus, M. F., & Rodgers, K. B. (2009). Parental knowledge and its sources examining the moderating roles of family structure and race. *Journal of Family Issues, 30*, 1356–1378. doi:10.1177/0192513X09334154.

Cohen, J. (1988). *Statistical power analysis for the behavioral science*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Coley, R. L., Votruba-Drzal, E., & Schindler, H. S. (2008). Trajectories of parenting processes and adolescent substance use: Reciprocal effects. *Journal of Abnormal Child Psychology, 36*, 613–625. doi:10.1007/s10802-007-9205-5.

Crouter, A. C., Bumpus, M. F., Davis, K. D., & McHale, S. M. (2005). How do parents learn about adolescents' experiences? Implications for parental knowledge and adolescent risky behavior. *Child Development, 76*, 869–882. doi:10.1111/j.1467-8624.2005.00883.x.

Crouter, A. C., & Head, M. R. (2002). Parental monitoring and knowledge of children. In M. H. Bornstein (Ed.), *Handbook of parenting: Vol. 3. Being and becoming a parent* (2nd ed., pp. 461–483). New Jersey, NJ: Lawrence Erlbaum Associates.

Currie, C., Nic Gabhainn, S., Godeau, E., Roberts, C., Smith, R., Currie, D., et al. (2008). *Inequalities in young people's health: HBSC international report from the 2005/06 Survey. Health policy for children and adolescents (Report No. 5)*. Copenhagen: WHO Regional Office for Europe.

Delegación del Gobierno para el Plan Nacional sobre Drogas. (2009). *Informe de la Encuesta Estatal sobre Uso de Drogas en Estudiantes de Enseñanzas Secundarias (ESTUDES) 2008*. Madrid: Ministerio de Sanidad y Política Social.

Dubas, J. S., & Gerris, J. R. M. (2002). Longitudinal changes in the time parents spend in activities with their adolescent children as a function of child age, pubertal status, and gender. *Journal of Family Psychology, 16*, 415–427. doi:10.1037//0893-3200.16.4.415.

Duncan, S. C., Duncan, T. E., & Hops, H. (1998). Progressions of alcohol, cigarette, and marijuana use in adolescence. *Journal of Behavioral Medicine, 21*, 375–388. doi:10.1023/A:1018730814379.

Elliot, D. S. (1993). Health-enhancing and health-compromising lifestyles. In S. G. Millstein, A. C. Petersen, & E. O. Nightingale (Eds.), *Promoting the health of adolescents: New directions for the twenty-first century* (pp. 119–150). New York, NY: Oxford University Press.

Engels, R. C. M. E., Finkenauer, C., Kerr, M., & Stattin, H. (2005). Illusions of parental control: Parenting and smoking onset in Dutch and Swedish adolescents. *Journal of Applied Social Psychology, 35*, 1912–1935. doi:10.1111/j.1559-1816.2005.tb02202.x.

Ghandour, L. A. (2009). Young adult alcohol involvement: The role of parental monitoring, child disclosure, and parental knowledge during childhood. *Dissertation Abstracts International: Section B. Sciences and Engineering, 69*(12), 7391.

Goldstein, S. E., Davis-Kean, P. E., & Eccles, J. S. (2005). Parents, peers, and problem behavior: A longitudinal investigation of the impact of relationship perceptions and characteristics on the development of adolescent problem behavior. *Developmental Psychology, 41*, 401–413. doi:10.1037/0012-1649.41.2.401.

Grusec, J. E., & Goodnow, J. J. (1994). Impact of parental discipline methods on the child's internalization values: A reconceptualization of currents points of view. *Developmental Psychology, 30*, 4–19. doi:10.1037/0012-1649.30.1.4.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (2008a). *Análisis multivariante* (5th ed.). Madrid: Prentice Hall.

Hair, E. C., Moore, K. A., Garrett, S. B., Ling, T., & Cleveland, K. (2008b). The continued importance of quality parent-adolescent relationships during late adolescence. *Journal of Research on Adolescence, 18*, 187–200. doi:10.1111/j.1532-7795.2008.00556.x.

Hair, E. C., Moore, K. A., Hadley, A. M., Kaye, K., Day, R. D., & Orthner, D. K. (2009). Parent marital quality and the parent-adolescent relationship: Effects on adolescent and young adult health outcomes. *Marriage and Family Review, 45*, 218–248. doi:10.1080/01494920902733567.

Harakeh, Z., Scholte, R. H. J., Vermulst, A. A., De Vries, H., & Engels, R. C. M. E. (2010). The relations between parents' smoking, general parenting, parental smoking communication, and adolescents' smoking. *Journal of Research on Adolescence, 20*, 140–165. doi:10.1111/j.1532-7795.2009.00626.x.

Hawkins, D. N., Amato, P. R., & King, V. (2006). Parent-adolescent involvement: The relative influence of parent gender and residence. *Journal of Marriage and the Family, 68*, 125–136. doi:10.1111/j.1741-3737.2006.00238.x.

Hayes, L., Hudson, A., & Matthews, J. (2003). Parental monitoring: A process model of parent-adolescent interaction. *Behaviour Change, 20*, 13–24. doi:10.1375/bech.20.1.13.24844.

Hayes, L., Hudson, A., & Matthews, J. (2004). Parental monitoring behaviors: A model of rules, supervision, and conflict. *Behavior Therapy, 35*, 587–604. doi:10.1016/S0005-7894(04)80033-9.

Hibell, B., Andersson, B., Ahlström, S., Balakireva, O., Bjarnasson, T., Kokkevi, A., et al. (2000). *The 1999 European School Survey Project on Alcohol and Other Drugs (ESPAD) Report. Alcohol and other drug use among students in 30 European countries*. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs (CAN) and The Pompidou Group at the Council of Europe.

Hibell, B., Guttormsson, U., Ahlström, S., Balakireva, O., Bjarnason, T., Kokkevi, A., et al. (2009). *The 2007 European School Survey Project on Alcohol and Other Drugs (ESPAD) Report. Substance use among students in 35 European countries*. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs (CAN).

Hublet, A., & Godeau, E. (2005). *HBSC research protocol for 2005/06 survey. Section 2. Scientific rationales for focus areas: Tobacco use.* Unpublished manuscript.

Jacobson, K. C., & Crockett, L. J. (2000). Parental monitoring and adolescent adjustment: An ecological perspective. *Journal of Research on Adolescence, 10*, 65–97. doi:10.1207/SJRA1001_4.

Jiménez-Iglesias, A. (2011). *Dimensiones familiares relevantes en la consecución del conocimiento parental y sus repercusiones sobre el ajuste adolescente. Un análisis internacional, nacional y local sobre la familia en la adolescencia*. Doctoral thesis, University of Seville, Seville.

Jiménez-Iglesias, A., Moreno, C., García-Moya, I., & Ramos, P. (2013). How can parents obtain knowledge about their adolescent children? *Infancia y Aprendizaje, 36*.

Jiménez-Iglesias, A., Moreno, C., Granado-Alcón, M. C., & López, A. (2012a). Parental knowledge and adolescent adjustment (substance use and Health-Related Quality of Life). *The Spanish Journal of Psychology, 15*, 132–144. doi:10.5209/rev_SJOP.2012.v15.n1.37297.

Jiménez-Iglesias, A., Moreno, C., Ramos, P., & Rivera, F. (2012b). What family dimensions are important for health-related quality of life in adolescence? Manuscript submitted for publication.

Kandel, D. B., & Jessor, R. (2002). The gateway hypothesis revisited. In D. B. Kandel (Ed.), *Stages and pathways of drug involvement. Examining the gateway hypothesis* (pp. 365–373). New York, NY: Cambridge University Press.

Keijsers, L., Branje, S. J. T., VanderValk, I. E., & Meeus, W. (2010). Reciprocal effects between parental solicitation, parental control, adolescent disclosure, and adolescent delinquency. *Journal of Research on Adolescence, 20*, 88–113. doi:10.1111/j.1532-7795.2009.00631.x.

Kerr, M., & Stattin, H. (2003). Parenting of adolescents: Action or reaction? In A. C. Crouter & A. Booth (Eds.), *Children's influence on family dynamics. The neglected side of family relationships* (pp. 121–151). London: Lawrence Erlbaum Associates.

Kerr, M., Stattin, H., & Burk, W. J. (2010). A reinterpretation of parental monitoring in longitudinal perspective. *Journal of Research on Adolescence, 20*, 39–64. doi:10.1111/j.1532-7795.2009.00623.x.

Kerr, M., Stattin, H., & Engels, R. C. M. E. (2008). Introduction: What's changed in research on parenting and adolescent problem behavior and what needs to change? In M. Kerr, H. Stattin, & R. C. M. E. Engels (Eds.), *What can parents do? New insights into the role of parents in adolescent problem behavior* (pp. 1–8). London: Wiley.

Kerr, M., Stattin, H., & Trost, K. (1999). To know you is to trust you: Parents' trust is rooted in child disclosure of information. *Journal of Adolescence, 22*, 737–752. doi:10.1006/jado.1999.0266.

Kiriakidis, S. P. (2006). Perceived parental care and supervision: Relations with cognitive representations of future offending in a sample of young offenders. *International Journal of Offender Therapy and Comparative Criminology, 50*, 187–203. doi:10.1177/0306624X05278517.

Klimidis, S., Minas, I. H., & Ata, A. W. (1992). The PBI-BC: A brief current form of the parental bonding instrument for adolescent research. *Comprehensive Psychiatry, 33*, 374–377. doi:10.1016/0010-440X(92)90058-X.

Koutakis, N., Stattin, H., & Kerr, M. (2008). Reducing youth alcohol drinking through a parent-targeted intervention: The Örebro prevention program. *Addiction, 103*, 1629–1637. doi:10.1111/j.1360-0443.2008.02326.x.

Kuntsche, E., Van Der Vorst, H., & Engels, R. (2009). The earlier the more? Differences in the links between age at first drink and adolescent alcohol use and related problems according to quality of parent-child relationships. *Journal of Studies on Alcohol and Drugs, 70*, 346–354. Retrieved from http://www.jsad.com/.

Laird, R. D., & Marrero, M. D. (2010). Information management and behavior problems: Is concealing misbehavior necessarily a sign of trouble? *Journal of Adolescence, 33*, 297–308. doi:10.1016/j.adolescence.2009.05.018.

Laird, R. D., Marrero, M. D., & Sentse, M. (2010). Revisiting parental monitoring: Evidence that parental solicitation can be effective when needed most. *Journal of Youth and Adolescence, 39*, 1431–1441. doi:10.1007/s10964-009-9453-5.

Laird, R. D., Pettit, G. S., Bates, J. E., & Dodge, K. A. (2003). Parents' monitoring-relevant knowledge and adolescents' delinquent behavior: Evidence of correlated developmental changes and reciprocal influences. *Child Development, 74*, 752–768. doi:10.1111/1467-8624.00566.

Li, X., Feigelman, S., & Stanton, B. (2000a). Perceived parental monitoring and health risk behaviors among urban low-income African-American children and adolescents. *Journal of Adolescent Health, 27*, 43–48. doi:10.1016/S1054-139X(99)00077-4.

Li, X., Mao, R., Stanton, B., & Zhao, Q. (2010). Parental, behavioral, and psychological factors associated with cigarette smoking among secondary school students in Nanjing, China. *Journal of Child and Family Studies, 19*, 308–317. doi:10.1007/s10826-009-9299-1.

Li, X., Stanton, B., & Feigelman, S. (2000b). Impact of perceived parental monitoring on adolescent risk behavior over 4 Years. *Journal of Adolescent Health, 27*, 49–56. doi:10.1016/S1054-139X(00)00092-6.

Macaulay, A. P., Griffin, K. W., Gronewold, E., Williams, C., & Botvin, G. J. (2005). Parenting practices and adolescent drug-related knowledge, attitudes, norms and behavior. *Journal of Alcohol and Drug Education, 49*, 67–83. Retrieved from: http://www.jadejournal.com/.

Maccoby, E. E. (2003). The gender of child and parent as factors in family dynamics. In A. C. Crouter & A. Booth (Eds.), *Children's influence on family dynamics. The neglected side of family relationships* (pp. 191–206). London: Lawrence Erlbaum Associates.

Marshall, S. K., Tilton-Weaver, L. C., & Bosdet, L. (2005). Information management: Considering adolescents' regulation of parental knowledge. *Journal of Adolescence, 28*, 633–647. doi:10.1016/j.adolescence.2005.08.008.

Martínez Álvarez, J. L., Fuertes Martín, A., Ramos Vergeles, M., & Hernández Martín, A. (2003). Consumo de drogas en la adolescencia: Importancia del afecto y la supervisión parental. *Psicothema, 15,* 161–166. Retrieved from http://www.psicothema.com/.

Moral Jiménez, M. V., Ovejero Bernal, A., Castro, Á., Rodríguez Díaz, F. J., & Sirvent-Ruiz, C. (2011). Modificación de actitudes hacia el consumo de sustancias en adolescentes: Seguimiento de las diferencias inter-género. *International Journal of Clinical and Health Psychology, 11*, 291–311. Retieved from http://www.aepc.es/ijchp/.

Moreno, C., Ramos, P., Rivera, F., Muñoz-Tinoco, V., Sánchez-Queija, I., Granado, M. C., et al. (2011). *Desarrollo adolescente y salud en España. Resumen del estudio Health Behaviour in School-aged Children (HBSC-2006)*. Madrid: Ministerio de Sanidad, Política Social e Igualdad.

Mounts, N. S. (2008). Linkages between parenting and peer relationships: A model for parental management of adolescents' peer relationships. In M. Kerr, H. Stattin, & R. C. M. E. Engels (Eds.), *What can parents do? New insights into the role of parents in adolescent problem behaviors* (pp. 163–189). London: Wiley.

Observatorio Europeo de las Drogas y las Toxicomanías (OEDT). (2010). *Informe anual 2010. El problema de la drogodependencia en Europa*. Luxembourg: Oficina de Publicaciones de la Unión Europea.

Oliva, A., & Parra, Á. (2004). Contexto familiar y desarrollo psicológico durante la adolescencia. In E. Arranz (Ed.), *Familia y desarrollo psicológico* (pp. 96–123). Madrid: Pearson Prentice-Hall.

Oliva, A., Parra, Á., Sánchez-Queija, I., & López, F. (2007). Estilos educativos materno y paterno: Evaluación y relación con el

ajuste adolescente. *Anales de Psicología, 23*, 49–56. Retrieved from http://www.um.es/analesps/.

Parra, Á., & Oliva, A. (2006). Un análisis longitudinal sobre las dimensiones relevantes del estilo parental durante la adolescencia. *Infancia y Aprendizaje, 29*, 453–470. doi:10.1174/021037006778849594.

Pastor, Y., Balaguer, I., & García-Merita, M. L. (1999). *Estilos de vida y salud*. Valencia: Albatros.

Piko, B. F., & Kovács, E. (2010). Do parents and school matter? Protective factors for adolescent substance use. *Addictive Behaviors, 35*, 53–56. doi:10.1016/j.addbeh.2009.08.004.

Rai, A. A., Stanton, B., Wu, Y., Li, X., Galbraith, J., Cottrell, L., et al. (2003). Relative influences of perceived parental monitoring and perceived peer involvement on adolescent risk behaviors: An analysis of six cross-sectional data sets. *Journal of Adolescent Health, 33*, 108–118. doi:10.1016/S1054-139X(03)00179-4.

Ramos, P., Moreno, C., Rivera, F., & López, A. (2011). The classification of Spanish adolescents based on substance consumption patterns and the analysis of the relationships within their social developmental contexts. *The Spanish Journal of Psychology, 14*, 734–745. doi:10.5209/rev_SJOP.2011.v14.n2.21.

Richards, M. H., Miller, B. V., O'Donnell, P. C., Wasserman, M. S., & Colder, C. (2004). Parental monitoring mediates the effects of age and sex on problem behaviors among African American urban young adolescents. *Journal of Youth and Adolescence, 33*, 221–233. doi:10.1023/B:JOYO.0000025321.27416.f6.

Ridao, P., & Moreno, C. (2008). Percepción de los adolescentes y sus progenitores de la adolescencia como etapa evolutiva. *Infancia y Aprendizaje, 31*, 499–513. doi:10.1174/021037008786140904.

Rodrigo, M. J., Máiquez, M. L., García, M., Mendoza, R., Rubio, A., Martínez, A., et al. (2004). Relaciones padres-hijos y estilos de vida en la adolescencia. *Psicothema, 16*, 203–210. Retrieved from http://www.psicothema.com/.

Rubin, K. H., Bukowski, W. M., & Parker, J. G. (2006). Peer interactions, relationships, and groups. In N. Eisenberg (Ed.), *Handbook of child psychology: Vol. 3. Social, emotional and personality development* (6th ed., pp. 619–700). New Jersey, NJ: Wiley.

Sánchez-Queija, I., Moreno, C., Muñoz-Tinoco, V., & Pérez Moreno, P. J. (2007). Adolescencia, grupo de iguales y consumo de sustancias. Un estudio descriptivo y relacional. *Apuntes de Psicología, 25*, 305–324. Retrieved from http://www.cop.es/delegaci/andocci/es/RevistaApuntesDePsicologia.asp.

Schmid, H., Fotiou, A., Godeau, E., Simons-Morton, B., & Hublet, A. (2005). *HBSC research protocol for 2005/06 survey. Section 2. Scientific rationales for focus areas: Alcohol use.* Unpublished manuscript.

Secades-Villa, R., Fernández-Hermida, J. R., & Vallejo-Seco, G. (2005). Family risk factors for adolescent drug misuse in Spain. *Journal of Child & Adolescent Substance Abuse, 14*, 1–15. doi:10.1300/J029v14n03_01.

Shanahan, L., & Sobolewski, J. M. (2003). Child effects as family process. In A. C. Crouter & A. Booth (Eds.), *Children's influence on family dynamics. The neglected side of family relationships* (pp. 237–252). London: Lawrence Erlbaum Associates.

Simões, C., Gaspar-Matos, M., Moreno, C., Rivera, F., Batista-Foguet, J. M., & Simons-Morton, B. (2012). Substance use in Portuguese and Spanish adolescents: Highlights from differences, similarities and moderate effects. *The Spanish Journal of Psychology, 15*, 1024–1037. doi:10.5209/rev_SJOP.2012.v15.n3.39393.

Simons, L. G., & Conger, R. D. (2007). Linking mother-father differences in parenting to a typology of family parenting styles and adolescent outcomes. *Journal of Family Issues, 28*, 212–241. doi:10.1177/0192513X06294593.

Simons-Morton, B. G., Farhat, T., ter Bogt, T. F. M., Hublet, A., Kuntsche, E., Nic Gabhainn, S., et al. (2009). Gender specific trends in alcohol use: Cross-cultural comparisons from 1998 to 2006 in 24 countries and regions. *International Journal of Public Health, 54*(Suppl. 2), 199–208. doi:10.1007/s00038-009-5411-y.

Smetana, J. G., Campione-Barr, N., & Metzger, A. (2006). Adolescent development in interpersonal and societal contexts. *Annual Review of Psychology, 57*, 255–284. doi:10.1146/annurev.psych.57.102904.190124.

Soenens, B., Vansteenkiste, M., Luyckx, K., & Goossens, L. (2006). Parenting and adolescent problem behavior: An integrated model with adolescent self-disclosure and perceived parental knowledge as intervening variables. *Developmental Psychology, 42*, 305–318. doi:10.1037/0012-1649.42.2.305.

Stattin, H., & Kerr, M. (2009). Challenges in intervention research on adolescent development. *Journal of Adolescence, 32*, 1437–1442. doi:10.1016/j.adolescence.2009.10.010.

Stattin, H., Kerr, M., & Tilton-Weaver, L. (2010). Parental monitoring: A critical examination of the research. In V. Guilamo-Ramos, J. Jaccard, & P. Dittus (Eds.), *Parental Monitoring of Adolescents: Pt. 1. Contemporary issues in parental monitoring* (pp. 3–38). New York, NY: Columbia University Press.

Stavrinides, P., Georgiou, S., & Demetriou, A. (2010). Longitudinal associations between adolescent alcohol use and parents' sources of knowledge. *British Journal of Developmental Psychology, 28*, 643–655. doi:10.1348/026151009X466578.

Sweeting, H., West, P., & Richards, M. (1998). Teenage family life, lifestyles and life chances: Associations with the family structure, conflict with parents and joint family activity. *International Journal of Law, Policy and the Family, 12*, 15–46. doi:10.1093/lawfam/12.1.15.

Tabak, I., Mazur, J., Granado Alcón, M. C., Orkenyi, A., Zaborskis, A., Aasvee, K., et al. (2012). Examining trends in parent-child communication in Europe over 12 years. *The Journal of Early Adolescence, 32*, 26–54. doi:10.1177/0272431611419509.

Tebes, J. K., Cook, E. C., Vanderploeg, J. J., Feinn, R., Chinman, M. J., Shepard, J. K., et al. (2011). Parental knowledge and substance use among African American adolescents: Influence of gender and grade level. *Journal of Child and Family Studies, 20*, 406–413. doi:10.1007/s10826-010-9406-3.

Tilton-Weaver, L., Kerr, M., Pakalniskeine, V., Tokic, A., Salihovic, S., & Stattin, H. (2010). Open up or close down: How do parental reactions affect youth information management? *Journal of Adolescence, 33*, 333–346. doi:10.1016/j.adolescence.2009.07.011.

Waizenhofer, R. N., Buchanan, C. M., & Jackson-Newsom, J. (2004). Mothers' and fathers' knowledge of adolescents' daily activities: Its sources and its links with adolescent adjustment. *Journal of Family Psychology, 18*, 348–360. doi:10.1037/0893-3200.18.2.348.

White, J., & Halliwell, E. (2010). Alcohol and tobacco use during adolescence: The importance of the family mealtime environment. *Journal of Health Psychology, 15*, 526–532. doi:10.1177/1359105309355337.

Windle, M. (2000). Parental, sibling, and peer influences on adolescent substance use and alcohol problems. *Applied Developmental Science, 4*, 98–110. doi:10.1207/S1532480XADS0402_5.

Yau, J. P., Tasopoulos-Chan, M., & Smetana, J. G. (2009). Disclosure to parents about everyday activities among American adolescents from Mexican, Chinese, and European backgrounds. *Child Development, 80*, 1481–1498. doi:10.1111/j.1467-8624.2009.01346.x.