

PARENT AND PEER INFLUENCE MODELS IN THE ONSET OF ADOLESCENT SMOKING

MODELOS DE INFLUENCIA DE PADRES Y AMIGOS EN EL INICIO DEL CONSUMO DE TABACO EN ADOLESCENTES

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Abstract

Tobacco is the second most commonly used drug among adolescents. Aim. The aim is to analyse the influence of different socializing agents: parents and peers, in the use and the intention of use among adolescents. Methods. Cross-sectional study in a school setting in Spain. 5,828 youngsters (50.2% males, 49.8% females) recruited in Secondary Education Centres (mean age 14.15). Main outcome measures: Self-reported tobacco use (ever and current use of cigarettes), attitudes toward tobacco and influence groups tobacco use. Findings. There is a relative importance of parent influence to adolescent smoking onset. Peer tobacco use is the variable that increases the most the probability of use. Smoking is more likely among those subjects whose friends smoke (odds ratio 7.16, 95% confidence interval 5,5 - 9,3), than among those whose friends are non-smokers. Conclusions. Peer behaviour plays a predominant role in the onset and regular use of tobacco. Girls are more vulnerable to social pressure, the use or intention to use increases more sharply among girls in the presence of friends who smoke than among boys.

Keywords Tobacco; adolescent; family; peer; predictive models.

Resumen

El tabaco es la segunda droga más utilizada por los adolescentes. Objetivo. Analizar la influencia de diferentes agentes de socialización: padres y compañeros, en el uso y en la intención de uso por los adolescentes. Método: Estudio transversal en ámbito escolar. N=5,828 jóvenes (50.2% chicos, 49.8% chicas) estudiantes de Centros de Educación Secundaria (media de edad=14.15). Medidas: Consumo auto-informado de cigarrillos, actitudes hacia el tabaco y uso de tabaco por el grupo de influencia. Resultados: El consumo de tabaco por los compañeros es la variable que más incrementa la probabilidad y la intención de uso. Fumar es más probable entre los sujetos cuyos amigos fuman (odds ratio 7.16, I.C. 95% 5,5-9,3), que entre aquellos cuyos amigos no son fumadores. Conclusiones: La conducta de los compañeros juega un papel predominante en el inicio y mantenimiento del hábito tabáquico. Las chicas son más vulnerables a la influencia social. En consecuencia, la probabilidad de uso o intención de uso es mayor entre las chicas que entre los chicos ante la presencia de amigo/as que fuman.

Palabras clave: Tabaco; adolescentes; familia; grupo de pares; modelos predictivos.

Correspondencia: Daniel Lloret Irles Health Psychology Department. Universidad Miguel Hernández. Ctra. de Valencia s/n 03550 Sant Joan d`Alacant, Alicante (España) E-mail: daniel.lloret@umh.es Tfno: +34 965 919 406 - 965 919 319 Fax.- +34 965 919 566 Tobacco is the second most commonly used drug among adolescents. In Europe the tobacco use rate slightly decreases since ESPAD, European School Survey Project on Alcohol and Other Drugs, (Hibell, Guttormsson, Ahlström, Balakireva, Bjarnason, Kokkevi y Kraus, 2012) data is collected. In the adolescent population, the prevalence of use "at least once in a lifetime" is on average 55% (56% in boys and 54% in girls) in the 36 European countries that participated in the last ESPAD pool. Approximately 56% of those that tried tobacco, smoked during the last 30 days. The proportion of students that start smoking daily when they are 13 years old is 7%, and it can reach 14% in some countries.

In Spain, research carried out with similar populations of adolescents of either gender with a mean age of 16 years, shows that "last 30 days use" has dropped five points during the last decade up to 26.2% in 2010 (Observatorio Español sobre Drogas, 2010). The mean age for onset is 13.5 years, that has not varied in the last 10 years. The starting age for daily consumption comes one year later (14.3 years old). Although tobacco smoking has been traditionally associated with boys, nowadays no gender differences are reported.

First smoking experiences occur in the early years of adolescence when two important socializing agents converge: family and peers (Baker *et al.*, 2004; Bauman *et al.*, 2001; De Vries *et al.*, 2003; Kristjansson *et al.*, 2010). Indeed young people refer to their first use during early adolescence, when family influence still has a privileged position in attitude shaping and the development of new behaviour (Bricker *et al.*, 2007). Over recent decades a large number of studies aimed at analysing the relation between drug use (and other problematic behaviours) and family features have been carried out. Special attention has been paid to family conflict, low family cohesion, poor communication, educational styles or even the family structure itself. These factors have a general character and are the basis of a wide range of problematic behaviour patterns rather than just tobacco and drug use.

On the other hand, some research indicates that parental influence on adolescent behaviour may be moderated by the quality of emotional relations and the gender of the young person. In fact an analysis of these variables concludes that the group of adolescents with parents who smoked and low emotional bonds registers a higher prevalence of use. The difference is even more notable in girls than in boys (Wen et al., 2005). However, the smoking habit of the parents in itself, taken as a model of tobacco use, represents a specific risk factor and is, therefore, more important in explaining the tobacco use of the children. The theory of Social Learning (Bandura, 1973) proposes an explanation both for onset and a regular smoking habit among young people, based on the presence of a parental model of smoker. This hypothesis is supported by numerous studies which conclude that tobacco use by parents contributes to the onset of smoking among their children, even where parents are health-conscious in family management, defend an

anti-smoking stance and do not smoke in front of their children (Espada *et al.*, 2008; Hill *et al.*, 2005). It has also been shown that, apart from tobacco use, parental attitudes towards smoking are also closely related to smoking among their children (Alfonso *et al.*, 2009; Lloret *et al.*, 2008; Wen *et. al.*, 2005).

The other influence group consists of their peers. Tobacco use among the peer group is considered an important risk factor for the onset of smoking and a regular smoking habit. The use of tobacco as social facilitator is widespread among adolescents. Indeed some authors maintain that group pressure adopts different forms of influence; from an explicit invitation to smoke to the sense of rejection of those who resist the majority and chose not to smoke. The favourable attitude of the group of friends towards alcohol, tobacco and cannabis is an important factor in the first experiment with cannabis (Agrawal *et al.*, 2007; Fujimoto, Unger, and Valente, 2012). Nonetheless, peer group pressure is affected by social relations, such as the degree of dependence on the group or other personal character factors like the social skills of the young person, their self-esteem, degree of assertiveness and so on.

On the other hand, use by the peer group does not seem to have the same influence when the users are not direct friends. De Vries *et al.* (2003), having analysed a sample of 7,102 adolescents from six European countries, conclude that there is no evidence to show that use by other young people of the same age represents a predictor of use. Instead, young people choose their friends according to their similar cannabis user habits.

Risk can be understood as a measurable probability of something happening with harmful consequences or negative effects (Farré, 2005). Although there is still a lack of conceptual definition (García del Castillo, 2013), low perception of risk associated with use is supported by research results as one of the main risk factors. Consequently, the lower the perception of risk, the higher the prevalence of use (de la Villa Moral, Rodríguez y Sirvent, 2006; Hibell *et al.*, 2012; OED, 2010). Some studies suggest that informal control mechanisms, such as lower levels of use among group of friends, friends' influence, the perception of low accessibility, are powerful inhibitors of use. The influence of friends is associated with a lessened perception of risk (Romer & Hennessy, 2007).

Finally, when comparing the influence between family and peer use models, results suggest that both agents play an important role in the onset and habitual use of tobacco (Glynn, 1981, Eunyoung, Dae-Hoon & Minwoo, 2010). However, data do not support the argument that both variables, parents and peers, are related. There is no evidence to sustain that the offspring of parents who smoke are more likely to establish friendship with other adolescents who smoke (Engels *et al.*, 2004).

Considering previous research results, the aim is to determine the influence of both socializing agents: parents and peer, in the use and the intention of use among adolescents, moreover to analyse its role in the attitude towards tobacco. Furthermore, we seek to analyse the explanatory and predictive weight of each selected variable from a gender perspective.

We hypothesize that different socializing agents, as well as attitudes toward tobacco use, will play a similar role either for use or intention to use in the future. Likewise, the predictive weight of each variable will be independent of the gender. In order to verify those objectives we carried out a cross sectional design and a ex post facto prospective research.

METHOD

Participants

The sample was obtained from 43 secondary education public centres of a coastal region of Spain. In order to guarantee that cultural and socio-economic diversity was properly represented, the centres were randomised selected from different socio-economic areas.

Table	1. Items	level of	completion.	Frequencies	and	l percetages
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	% of	Frequency	%		
Variables	completion	Yes - No	Yes - No		
	100	4910	81.6 18.4		
Regulations		1107			
Buying	100	1746 4272	29.0 91.0		
Father smokes	99.8	2542 3463	42.2 57.8		
Mother smokes	100	2291 3725	38.0 62.0		
Friends smoke	99.9	4413 1599	73.3 26.7		
Teachers smoke	98.8	5399 547	89.7 9.0		
reachers shioke	100	1167	19.4 80.6		
Do you smoke?		4851			
Frequency	20.8	1250			
Every day		398	6.6		
Some times a week	343		5.7		
Only when I g	o out	325	5.4		
Some times a year		183	3.0		
l used to, but not now.	96.9	520 5311	8.6 88.2		
Intention to smoke.	97.7	968 4916	16.0 81.7		
Attitude					
	% of completion	Mean	Standard Deviation		
Attitude	100	6.94	1.84		
Age	100	14.5	1.45		

Within each educational centre, the sampling process was realized by conglomerates, taking the class as the sample unit. The participating classes in each year of Secondary Education and Professional Training were selected randomly. The survey was administered in each of the educational centres by the teachers themselves.

The sample was made up of 5,828 youngsters (50.2% males and 49.8% females) with an age range from 12 to 17 years old. The mean age was 14.15 years, with a standard deviation of 1.45. In terms of the distribution of the sample according to the main variables of the study, and with reference to smoking among parents, 23% stated that both parents smoked, 34% reported that only one parent smoked and 43% stated that neither parent smoked. Most participants (73%) reported that some friend used tobacco. Table1 shows the frequencies and percentages of each variable analysed.

Analysed variables were measured with a 22-item survey on habits, beliefs and attitudes towards tobacco use by the adolescent population. The survey was drawn up ad hoc by our research team, and it was reviewed to ensure the proper linguistic adaptation to the target population. The survey consisted of four areas to be explored:

The first area regards tobacco use by parents and peers. Tobacco use by parents was measured by two items. One related to the father and the other to the mother: "Does your father / mother smoke?" Dichotomic answer yes/no. Peer's tobacco use was measured by one item. "Do any of your friends smoke?" Dichotomic answer yes/no.

Second area, "Attitude toward tobacco" was measured with a true/false 10 item scale. The final score offers a continuous value from 0 for very favourable to 10 for very against tobacco use.

The third area "Intention to smoke" was measured by a single question with a dichotomic answer: yes/no. "Do you think that you will smoke in the future?"

And finally, to measure "Current tobacco use", we used a single question with a dichotomic answer: yes/no. "Do you smoke?".

Predictive variables were tobacco use of the father and the mother, peers' tobacco use, attitudes towards tobacco, gender and age. Result variables were adolescent tobacco use which took two forms: smokers and non-smokers. In the second case, the criterion was the intention to smoke in the future, which also split the sample in two groups: those that intended to smoke in the future and those that did not.

Procedure

Once the Ethical Committee approved the procedure and the consent of each of the 43 educational centres and the

respective Parents Associations had been obtained, we proceeded to identify the groups of young people that would participate in the study. In each centre, we selected groups from different ages.

All participating students fulfilled an anonymous survey during a 50-minute session, whereas the fulfilment average time was 25 minutes. At the proposal of the centres, the survey was administered by the teachers themselves, following the same protocol, set out in the "guidelines for administration of the survey", drawn up for that purpose. At the beginning of each session, every collaborator described the aim of the study and explained that all data were confidential. The following text was read aloud: "You have a survey containing a list of items, please read them accurately and answer them honestly. The survey is completely anonymous. It is necessary that you answer each item with absolute honesty. This is not a test, so there are no right or wrong answers. If you don't find the answer that fits exactly with your opinion, you should mark the closest one. When you finish please do not hand in your survey, but leave it on your table and I will pick it up. Many thanks for your collaboration."

Data analysis and statistical method

In order to evaluate the influence of the tobacco use of the different socializing agents in adolescent smoking behaviour and in their intention to smoke in the future, we carried out multivariate analysis with simultaneous logistic regression method.

In the first case, the criterion was adolescent tobacco use. In the second case, the criterion was the intention to smoke in the future. In both cases, the predictive variables were: tobacco use of the father and the mother, peers' tobacco use and attitudes towards tobacco and age.

At first both models (tobacco use and future intention) were tested with the whole sample. Later, separate models were formulated for boys and girls, in order to analyse the predictive weight of the studied variables in terms of gender. Finally, in order to correctly classify subjects in both models, we have determined the optimal cutting point using the receiving operating characteristic curve (ROC).

All analyses were carried out with IBM SPSS19 statistical software, assuming a 95% level of confidence for error type I.

RESULTS

The model for smoking in terms of the socialisation agents (parents and peers), and the attitudes towards smoking and age allows a correct classification of 68,9% (sensitivity=68,6% ; specificity= 68,9%) of all cases (χ^2 = 797,989; p < .001), giving as adjustment estimator a Nagelkerke's statistic R² equal to .205.

With reference to the odds ratio, smoking is more likely among those subjects whose friends smoke (5.09 times more probable) than among those whose friends are non-smokers and among older subjects (OR=1.41). In the same way, the likelihood of smoking is approximately 1.3 times higher among those subjects whose parents smoke (Father: OR= 1.35; Mother: 1.37) than among those parents do not smoke. Furthermore, the results show that an attitude against smoking reduces the probability of acquiring the habit (OR= .8).

If we consider the differences between the sexes, the model for smoking among young males gives a correct classification of 69.1% (sensitivity=70.6%; specificity= 72.3%; χ^2 = 426.456, p<.001). In this sense, the Nagelkerke's statistic R² gives an adjustment value of .916 for the boys' model and .217 for the girls.

Table 2. Results of binary logistic regression for smoking

Variables	Beta	Е.Т.	Wald	р	OR	IC	95%
Total Sample							
Father smokes	0.30	0.07	15.99	0.00	1.35	1.17	1.56
Mother smokes	0.31	0.08	17.11	0.00	1.37	1.18	1.58
Peer smoke	1.63	0.14	144.49	0.00	5.09	3.90	6.63
Attitudes	-0.23	0.02	138.14	0.00	0.80	0.77	0.83
Age	0.34	0.03	173.68	0.00	1.41	1.34	1.48
Constant	-6.48	0.41	247.88	0.00	0.00		
Boys							
Father smokes	0.38	0.11	12.67	0.00	1.47	1.19	1.81
Mother smokes	0.21	0.11	3.65	0.06	1.23	0.99	1.52
Peer smoke	1.44	0.18	61.18	0.00	4.21	2.94	6.03
Attitudes	-0.21	0.03	61.14	0.00	0.81	0.77	0.85
Age	0.37	0.04	99.28	0.00	1.45	1.35	1.56
Constant	-6.91	0.59	135.54	0.00	0.00		
Girls							
Father smokes	0.23	0.10	4.69	0.03	1.25	1.02	1.54
Mother smokes	0.40	0.10	14.90	0.00	1.50	1.22	1.84
Peer smoke	1.83	0.20	82.98	0.00	6.23	4.20	9.23
Attitudes	-0.24	0.03	77.11	0.00	0.79	0.75	0.83
Age	0.31	0.04	74.58	0.00	1.36	1.27	1.46
Constant	-6.08	0.57	112.91	0.00	0.00		

S.E.= standard error; *p*= associated probability; *OR*= odds ratio; *I.C.* 95%: confidence interval

Thus, the factors which best predict smoking among young males are, in this order, tobacco use by their friends (OR= 4.21), tobacco use by the father (OR= 1.47), age (OR=1.45) and tobacco use by the mother (OR=1.23). Having an unfavourable attitude to smoking reduces the likelihood of tobacco use (OR= .81). On the other hand, the factors which increase the likelihood of

smoking among young females are, in order of relevance: tobacco use by their friends (OR= 6.23) and by their mother (OR= 1.50), age (OR=1.36) and tobacco use by the father (OR=1.25). Among girls, an unfavourable attitude towards smoking reduces the likelihood of tobacco use (OR= .79). In table 2 we show the components of the models through logistic regression analysis.

Intention of smoking in the future

With reference to the intention of smoking in the future the model is correct in 66.2 % of the cases (sensitivity=66.6%; specificity=66.1; χ^2 = 526.61; p<.001) and includes the following variables: tobacco use by agents of socialisation (father, mother and friends) and attitudes (R² = .15).

In this sense, the odds ratio shows us that likelihood of an intention to smoke in the future is 6.5 times greater for those subjects whose friends smoke. Moreover, the probability of an intention to smoke increases 1.77 times where the father smokes and 1.55 times where the mother is a smoker. Once again, an anti-tobacco attitude reduces the likelihood of an intention to smoke in the future (OR= .83).

Table 3. Results for binary logistic regression for intention to smoke

Variables	Beta	S.E.	Wald	р	OR	IC 95%	
Total sample							
Father smokes	0.57	0.08	53.99	0.00	1.77	1.52	2.06
Mother smokes	0.44	0.08	31.84	0.00	1.55	1.33	1.81
Peer smoke	1.88	0.14	174.37	0.00	6.54	4.95	8.64
Attitudes	-0.18	0.02	85.20	0.00	0.83	0.80	0.86
Age	-0.02	0.03	0.70	0.40	0.98	0.93	1.03
Constant	-2.09	0.42	25.15	0.00	0.12		
Boys							
Father smokes	0.56	0.11	25.30	0.00	1.75	1.40	2.17
Mother smokes	0.26	0.11	5.68	0.02	1.30	1.05	1.62
Peer smoke	1.60	0.18	74.72	0.00	4.94	3.44	7.09
Attitudes	-0.15	0.03	30.05	0.00	0.86	0.81	0.91
Age	0.00	0.04	0.00	0.98	1.00	0.93	1.08
Constant	-2.33	0.59	15.50	0.00	0.10		
Girls							
Father smokes	0.60	0.11	29.46	0.00	1.81	1.46	2.25
Mother smokes	0.61	0.11	31.10	0.00	1.84	1.49	2.28
Peer smoke	2.22	0.22	97.88	0.00	9.22	5.94	14.31
Attitudes	-0.22	0.03	56.61	0.00	0.81	0.76	0.85
Age	-0.05	0.04	1.59	0.21	0.95	0.89	1.03
Constant	-1.90	0.59	10.33	0.00	0.15		

S.E.= standard error; *p*= associated probability; *OR*= odds ratio; *I.C.* 95%: confidence interval

In the differential analysis of an intention to smoke according to sex, the models are correct in 64.6% of cases among young men (sensitivity=64.4%; specificity=64.6 χ^2 = 202.235; p<.001) and in 68.7% in cases among young women (sensitivity=68.9% ; specificity=68.7; χ^2 = 337.19; p<.001). The adjustment value of the models gives an Nagelkerke's statistic R^2 equal to .12 in the case of young men and .19 in the case of young women. Regarding the variables which best predict the intention to smoke, in the young man's model the likelihood of smoking in the future was five times more if they had friends who were smokers (OR= 4.94) than if they did not and the likelihood also increased if both parents were smokers (Father: OR=1.74; Mother: OR=1.30). On the other hand, an anti-smoking stance played a protector role (OR= .86). In the young women's model, having friends who smoked increased 9.21 times the likelihood of an intention to smoke in the future. The probability of an intention to smoke in the future increased 1.8 times if both parents smoked (Mother: OR=1.84; Father: OR=1.81). Once again, as reflected in earlier models of the likelihood of an intention to smoke in the future decreases if there is an antismoking attitude (OR= .81).

In table 3 we detail the components of the models set up through the logistic regression analysis for the intention to smoke in the future.

DISCUSSION

The aim of this work is to analyse the influence of different socialising agents (parents and peers) in the use of tobacco by adolescents and their intention to use tobacco in the future. It was thought particularly important to know the future intention of tobacco use, taking into account that a third of the sample was 13-years-old or below, and European epidemiological studies state that this is the onset age for smoking.

Results suggest that peer tobacco use is the variable that most increases the probability of use as well as the intention of use in the future. Our findings indicate the predominant role of peer behaviour in the onset and regular use of tobacco. Our data agree with those found in similar research where peer influence is higher than that of parents (Blokland *et al.*, 2007; Kristjansson *et al.*, 2010; Smet *et al.*, 1999).

With the arrival of adolescence, the family loses influence as a behaviour model to peer pressure. Taking into account that onset age is around 13 years old, the same age as the beginning of adolescence, we should ask ourselves whether parents' influence is higher in early-adolescence than in the later stages of adolescence. Among the group of participants under 14 years old, a high level of parental influence is observed. Fourteen per cent of children of this age whose parents smoke, use tobacco as well. When parents do not smoke, only 5% of children under 14 years old use tobacco. That means that three times more children smoke if their parents do, which requires serious consideration of the effect of parental influence in the design of prevention programmes addressed at the early adolescent population. The difference between family and peer relevance, according to the stage of adolescence has been described by Kandel and Lesser (1972) as a hydraulic process, through which the level of peer influence increases, while the family influence decreases.

Furthermore, these results are in line with the Social Learning Theory that holds that the closer the model is perceived, the greater the influence it has. In this sense, there are many studies that show a firm association between drug use prevalence and friends that use drugs (Agrawal *et al.*, 2007; Brook *et al.*, 1990; Díaz & Sanabria, 1993; Espada *et al.*, 2008; Fujimoto, Unger, and Valente, 2012; Jessor & Jessor, 1977; Kandel *et al.*, 1990; Otero *et al.*, 1989).

Secondly, when we analyse the differential influence of each of the variables in gender terms, we observe how patterns of use in the family have a different effect according to the sex of the parent and of the minor. We can see that use by the mother is more closely related to use among girls, while use by the father is similarly closely related to use among boys. Peer influence also shows differences according to the sex of the minor. The results indicate that girls are more vulnerable to social pressure and thus the likelihood of use or intention to use increases more sharply among girls in the presence of friends who smoke than among boys.

The results call for a reflection on key aspects in the design of prevention programmes, such as the relation between the smoking habit of friends and the smoking habit of the adolescent and his/her intention to smoke in the future, as well as the gender differences in the model of parental influence on smoking: fathers on sons and mothers on daughters. Prevention programmes should incorporate components and activities which modify the influence that parents and peers exercise through modelling and peer pressure mechanisms. The results suggest that programmes designed for the very young should put special emphasis on the reactions and attitudes of the family towards smoking.

The study has some limitations which must be taken into account in order to ensure a cautious interpretation of the results. The data were collected by means of a self-administered survey, completed in class while the teacher was present in the classroom. This type of study does produce a tendency towards a socially desired response, which supposes bias in the validity of the results. We did not obtain other measurements which might have served to validate or contrast the data collected.

Another limitation of the study was the cross-sectional design used, as it does not allow us to determine whether the relationship between adolescent use and peer group use is unidirectional or reciprocal. In other words, whether the minor

who smokes is more likely to choose friends among other smokers or whether, on the contrary, it is the use of tobacco by others which causes the minor to begin smoking. Longitudinal studies are required to monitor a cohort from the age of 11 until the age of 17.

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