Addiction and Other Reasons Adolescent Smokers Give to Justify Smoking

Luis Borderías, Rosa Duarte, José Julián Escario & José Alberto Molina

Published online: 19 Nov 2015.

Submit your article to this journal ⏎

Article views: 6

View related articles ⏎

View Crossmark data ⏎

ORIGINAL ARTICLE

Addiction and Other Reasons Adolescent Smokers Give to Justify Smoking

Luis Borderías[1], Rosa Duarte[1], José Julián Escario [2] and José Alberto Molina[2]

[1]Hospital General San Jorge and Istituto Aragonés de Ciencias de la Salud, Huesca, Spain; [2]Department of Economic Analysis, University of Zaragoza, Zaragoza, Spain

Background: The primary purpose of this paper is to examine youth addiction and other justifications for adolescent smoking, and how they affect the level of consumption. *Methods:* Data from the Spanish 'State Survey on Drug Use among High School Students' aged between 14 and 18 years old were used in this paper. To account for the nature of the cigarette consumption data, several count data models were estimated in order to select the one that best fits adolescent smoking consumption. *Results:* Most adolescent smokers smoke because it relaxes them, and about a quarter of them recognize that they are addicted. Moreover, the latter group smoke 44% more cigarettes than the rest (IRR = 1.444), revealing the strong addictive nature of tobacco, even at early ages. Moreover, parents' smoking increases the probability of smoking and has an impact on the level of consumption. *Conclusions:* The implications of these findings offer insight for parents, researchers, educators, and cessation interventionists, as awareness of self-reported and other predictors held by smoking youth creates a vantage point to facilitate changes in smoking behavior.

Keywords: addiction, smoking predictors, smoking reasons, adolescents

INTRODUCTION

Since the appearance, in 1964, of the first official report documenting the harmful effects of tobacco consumption on smokers in the United States, namely *The Surgeon General's Report on Smoking and Health*, many countries have implemented policies aimed at reducing tobacco consumption: tax increases, or entirely new taxes, in order to increase tobacco prices, limitations on advertising, warning labels, limitations on the places where smoking is allowed, etc. At the same time, there has been a great amount of research to identify the determinants of cigarette smoking. However, despite these efforts, the

World Health Organization's *Report on the Global Tobacco Epidemic* (2013) considers tobacco as the leading global cause of preventable death. This shows that smoking continues to be a health problem of the first magnitude.

Given that most smokers begin smoking in adolescence or earlier (Smith, Phongsavan, Bauman, Havea, & Chey, 2007), and become regular smokers at the same stage of life (Vandewater, Park, Carey, & Wilkinson, 2014), it is important to understand the reasons that drive adolescents to start smoking and become regular smokers, which is why the bulk of the literature examining smoking predictors focuses on young children, pre-teens, and adolescents (Ali & Dwyer, 2009; Duarte, Escario, & Molina, 2014a; Kelly et al., 2011; McVicar, 2011; Piko & Balázs, 2012; Wileyto et al., 2009). Despite the complexity that rules the smoking decision, it is increasingly accepted that the predictors of smoking analyzed in the literature include, among others, socio-demographic characteristics, familial and social influences, psychosocial characteristics, genetic factors, cigarette prices, tobacco advertising campaigns, and addiction (Höhne, Pabst, Hannemann, & Kraus, 2014; O'Loughlin, Karp, Koulis, Paradis, & Difranza, 2009). Although literature has extensively analyzed the effects of these and other predictors on smoking, few papers have analyzed the reasons smokers provide to justify their behavior. Two notable exceptions are Precht, Keiding, Nielsen, & Madsen (2006) who analyze the reasons for initiating and maintaining smoking among secondary school adolescents with asthma, and Ramon Torrell, et al. (2009), on the reasons smokers give for kicking the habit.

Our paper aims to contribute to this scarce literature by analyzing the reasons adolescents give for taking up smoking, with a special emphasis on the role of addiction. We also investigate how these justifications influence the amount and frequency of smoking. We extend similar prior studies on smoking predictors by considering the effect of these predictors, not only on the probability of

Address correspondence to José Julián Escario; E-mail: jescario@unizar.es

becoming a smoker, or not, but also the effect on the number of cigarettes smoked.

METHODS

Sample

The data used in this work comes from the 2004 State Survey on Drug Use among High School Students, carried out by the Spanish Government Delegation for the National Plan on Drugs. (Subsequent surveys do not include information on the reasons why daily smokers currently smoke.) Participants constitute a nationally representative sample of Spanish students aged between 14 and 18 years. A total of 25,521 students were surveyed.

The Spanish Government Delegation for the National Plan on Drugs (GDNPD) works in accordance with the guidelines established by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). The approval of the survey and its content, considering the ethical aspects, was given by GDNPD and by the Research Ethical Committee of the Spanish Ministry of Health and Consumer Affairs. The Law of protection of personal data (Boletín Oficial del Estado, 1999) and the recommendations of ethical principles for medical research (World Medical Association, 2000) are followed.

All the information was obtained directly from the adolescents, anonymously. Parents were informed, in writing, about the purpose of the survey and could, if they wished, refuse to allow their children's participation. The percentage of students who declined to participate in the survey was 1.12%.

Dependent Variable

The dependent variable in the study is *CigaretteSmoking*, indicating the mean consumption of cigarettes per day over the last 30 days. We also present the prevalence of smoking among adolescents, and to that end we obtain the variable *Smoking*, dichotomizing the previous variable and taking value 1 if the individual has smoked cigarettes during the last 30 days, and 0 otherwise. Those adolescents who responded to the question 'Do you smoke cigarettes?' reporting 'I have smoked but only a few cigarettes in my life' are considered by the survey to be nonsmokers, and have not been asked about their smoking behavior for the last 30 days.

COVARIATES

The primary variables of interest in this work are the reasons that smokers report to justify their current status of smokers, and how these reasons influence the level of smoking. Consequently, we define a dichotomous variable for each of the reasons that appear in the survey: because I like it (*LikeIt*), because it relaxes me (*Relax*), because I do not know but I cannot stop smoking (*Addiction*), because it makes me feel better (*FeelBetter*), because

friends smoke (*Peer*), and because it is fashionable (*Fashion*).

In order to evaluate the effects of these justifications on the number of cigarettes smoked, we have also controlled for physical characteristics of the adolescents (gender and age), family characteristics (housewife mother, living without father, unemployed father, smoker mother, smoker father, smoker sibling, university degree of parents), as well as for the implementation of informative campaigns about drugs at school (Duarte, Escario, & Molina, 2014a; Lundborg, 2006). Table 1 provides the definition and a descriptive analysis of all variables.

Statistical Analysis

Given the nature of the dependent variable, we used a range of count data models in order to evaluate the association between the number of cigarettes smoked and the independent variables. A good review of these models can be found in Winkelmann (2008). More specifically, we have considered Poisson (P), Negative Binomial (NB), Zero Inflated Poisson (ZIP), and Zero Inflated Negative Binomial (ZINB) models. Unlike P and NB models, the ZIP and ZINB models have two equations, the nonsmoking or nonparticipation equation, in which individuals decide to be a smoker, or not, and the consumption equation where, conditional on not being a nonsmoker, individuals decide the quantity to smoke. In order to evaluate the association between the independent variables and *CigaretteSmoking*, and to interpret the coefficients, we report the Odds Ratios (OR) and the Incidence Rate Ratios (IRR). The IRR provide the relative change in the level of cigarette consumption when the independent variable increases by one unit. Similar to the OR, an IRR higher than one implies that the explanatory variable has a positive impact on cigarette smoking. The statistical analysis was carried out with Stata 8 software.

RESULTS

Table 2 shows what reasons adolescent smokers provided for their current smoking (more than one reason can be given). This information is also provided by gender and by age. Accordingly, most individuals justify their current status as smokers because they enjoy it (58.6%). The second most important reason is that tobacco relaxes them (53.69%). The third reason is addiction; 25.02% of adolescents declare that they do not know why they smoke but they cannot give up the habit. The other three reasons provided by the survey are reported by a fewer percentage of smokers compared to the previous reasons: to feel better (4.24%), because peers smoke (3.10%), and because it is fashionable (1.47%).

The reasons given by adolescents barely differ across gender and age. Perhaps the most important gender differences are that the addiction explanation is more important for females (27.25%) than for males (22.6%), that a higher percentage of girls declare that smoking relaxes

TABLE 1. Descriptive Analysis

		Percentage or mean (SD)
Smoking	This takes value 1 if the adolescent has smoked more than one cigarette per day in the last month and 0 otherwise	32.65
Smoking Girls[a]	This takes value 1 if the adolescent girl has smoked more than one cigarette per day in the last month and 0 otherwise	36.01
Smoking Boys[a]	This takes value 1 if the adolescent boy has smoked more than one cigarette per day in the last month and 0 otherwise	29.18
Cigarette Smoking	Number of cigarettes smoked per day in the last month	7.50 (5.69)
Cigarette Smoking Girls[b]	Number of cigarettes smoked per day in the last month	7.31 (5.40)
Cigarette Smoking Boys[b]	Number of cigarettes smoked per day in the last month	7.76 (6.04)
LikeIt	It takes value 1 if the adolescent declare that on of the principal reason why he/she smokes is because he/she like it	58.62
Relax	It takes value 1 if the adolescent declare that on of the principal reason why he/she smokes is because it relaxes him/her	53.69
Addiction	It takes value 1 if the adolescent declare that on of the principal reason why he/she smokes is because he/she can stop it	25.02
Fel Better	It takes value 1 if the adolescent declare that on of the principal reason why he/she smokes is because he/she feels better	4.24
Peer	It takes value 1 if the adolescent declare that on of the principal reason why he/she smokes is because their friends do it.	3.10
Fashion	It takes value 1 if the adolescent declare that on of the principal reason why he/she smokes if because it is fashionable	1.47
Gender	This takes the value 1 if the young person is male and 0 if female	49.25
Age14	This takes value 1 if the adolescent is 14 years old and 0 otherwise (*omitted category*)	20.63
Age15	This takes value 1 if the adolescent is 15 years old and 0 otherwise	27.64
Age16	This takes value 1 if the adolescent is 16 years old and 0 otherwise	34.87
Age17	This takes value 1 if the adolescent is 17 years old and 0 otherwise	16.86
Age18	This takes value 1 if the adolescent is 14 years old and 0 otherwise	6.44
Housewife	This takes value 1 if the mother is a housewife and 0 otherwise	32.45
Without Father	This takes value 1 if the adolescent lives without the father at home and 0 otherwise	12.16
Unemployed Father	This takes value 1 if the father of the adolescent is unemployed and 0 otherwise	1.54
Smoker Mother	This takes value 1 if the mother of the adolescent smokes and 0 otherwise	31.77
Smoker Father	This takes value 1 if the father of the adolescent smokes and 0 otherwise	31.92
Smoker Sibling	This takes value 1 if other sibling of the adolescent smokes and 0 otherwise	15.19
University Mother	This takes value 1 if the mother has a university degree and 0 otherwise	20.41
University Father	This takes value 1 if the father has a university degree and 0 otherwise	22.96
Information Campaign	This takes value 1 if the adolescent studies at a school which has implemented information campaigns on the risks associated with tobacco, alcohol and drug consumption and 0 otherwise	75.38

Note. All figures indicate percentages except for cigarette smoking variables that indicate means (and standard deviation in parenthesis). [a,b] A two-sample *t*- test with unequal variances rejects the null hypothesis of equal mean among genders for both variables: $p < .0001$ for the variable *Smoking* and $p = .0013$ for the variable *Cigarette Smoking*.

them (55.10% vs. 51.82%), and that the peer justification for smoking is important for nearly twice as many boys as girls (4.15% versus 2.32%). With reference to age, the most noticeable result is that the percentage of individuals who say they smoke because friends smoke declines constantly from 7.14% for adolescents aged 14, to 1.58% for those aged 18. A similar pattern is found for the fashionable reason, declining from 3.57% to 1.05%.

Several tests, including LR tests and Vuong tests, reported in Table 3, select the ZIP model as our preferred model. Given that only smokers report the reasons why they currently smoke, there is no point in including them in the equation that explains the decision to be a non-smoker (the nonparticipation equation), and so these variables only appear in the consumption equation. Including these variables in the consumption equation causes estimation problems when estimating the ZINB model. Thus, all explanatory variables appear as not significant in the nonparticipation equation, it is rejected against the NB model, and the coefficients for the consumption equation are very similar to the NB model. On the contrary, the ZIP models do not yield these estimation problems and provide plausible results also for the nonparticipation equation.

TABLE 2. Reasons why adolescents are smokers (Descriptive analysis)

	All	Girls	Boys	14 years old	15 years old	16 years old	17 years old	18 years old
LikeIt	58.62	58.51	58.76	58.48	57.23	59.54	57.67	60.66
Relax	53.69	55.10	51.82	51.34	51.73	53.48	55.59	55.53
Addiction	25.02	27.25	22.06	26.12	25.19	25.46	24.55	23.68
FelBetter	4.24	4.11	4.41	9.15	4.60	4.08	3.24	3.42
Peer	3.10	2.32	4.15	7.14	4.03	3.21	1.74	1.58
Fashion	1.47	1.12	1.92	3.57	1.92	1.35	0.87	1.05

Note. All figures indicate percentages

The estimates reported in Table 4 for the ZIP model shows that the probability of being a nonsmoker is greater for boys than for girls (OR = 1.513) and that this probability decreases as adolescents grow older. Similarly, the probability of being a nonsmoker is lower for those whose parents are smokers (OR = 0.738 for having a smoker mother and OR = 0.837 for having a smoker father). Similarly, having a smoker sibling is associated with a lower probability of being a nonsmoker (OR = 0.407). On the contrary, informative campaigns at school increase the odds of adolescents remaining nonsmokers, by 31.1 percentage points (OR = 1.311).

With respect to the consumption equation, the IRR gives the relative change in the dependent variable for every unit increase in the explanatory variables. According to this, boys smoke around 7.5% (IRR = 1.075) more cigarettes than girls. The level of consumption increases quite rapidly with age; compared with adolescents aged 14, the consumption of cigarettes increases by 20.9%, 31.8%, 45.6%, and 69.5% for those aged 15, 16, 17, and 18, respectively. The number of cigarettes smoked is also higher for those who have a smoker mother (IRR = 1.097) and for those who have a smoker father (IRR = 1.087). On the contrary, school campaigns reduce the number of cigarettes consumed by 2 percentage points (IRR = 0.9807), indicating that they have a moderate quantitative effect in the consumption equation.

Focusing now on how the reasons why adolescents currently smoke affect the number of cigarettes smoked, we find that the most important appears to be addiction. Thus, those adolescents who declare that they do not know why they smoke, but they cannot give it up, smoke 44.4% more cigarettes than the rest. The following reasons, in order of importance, are because they like it (IRR = 1.280), because it relaxes them (1.150), and because it makes them feel better (IRR = 1.142). By contrast, those who declare that they smoke because it is fashionable smoke 10.3% fewer cigarettes (IRR = 0.897). Similarly, those who smoke because other friends smoke too, consume fewer cigarettes by around 7.2 percentage points (IRR = 0.928). All results are very similar when the model is estimated separately for boys and girls.

DISCUSSION AND CONCLUSIONS

Our study reveals that smoking among Spanish adolescents is a quite common behaviour. More specifically, 32.65% of students aged from 14 to 18 reported having smoked in the last month. This percentage is higher among girls (36.01%) than among boys (29.18%). The average number of cigarettes smoked per day in the last month, conditional on being a smoker, is 7.50 cigarettes. This figure is lower among girls (7.31 cigarettes) than among boys (7.76 cigarettes). These gender differences are significant in both cases ($p < .0001$, $p = .0013$, respectively).

While a fair amount of the literature focuses on smoking determinants, an examination of the role of the subjective reasons reported by adolescents smokers is scarce (Precht et al., 2006; Ramon Torrell et al., 2009). Our work examines these subjective explanations. This topic is of great relevance in explaining smoking behavior, since beliefs, rather than reality, are what drive behavior (Foster & Frijters, 2010). Consequently, it is important to know what reasons adolescents provide to explain their smoking.

The most important reasons given by these individuals are because they like to smoke (58.62%), and because smoking allows them to relax (53.69%), entailing increases in the number of cigarettes smoked by 28% and 15%, respectively. With reference to the first reason, it appears that, as has been pointed out, the tobacco industry could have had some measure of success in presenting smoking as being 'tough' and 'cool' (Comité Nacional para la Prevención del Tabaquismo, 1998). Precht et al. (2006) reported that around 71% of pupils in Denmark declared that they smoke because it is relaxing. Even though the prevalence of this factor is lower in Spain, the figure is still a matter of some concern, implying as it does that a majority of adolescents seek tobacco as an instrument to control the nerves. But this strategy will trap a significant portion of them in the smoking habit.

TABLE 3. Model selection tests

	Statistic	*p*-value
NB vs. P (LR test)	4.0e+04***	<.0001
ZIP vs P (Vuong test)	26.86***	<.0001
ZINB vs NB (Vuong test)	0.00	.5017
ZINB vs. ZIP (LR test)	1.7e+04***	<.0001

Note. *** significant at 1%.

TABLE 4. Reasons why adolescents currently smoke (Regressions)

Variable	All		Girls		Boys	
	IRR	*p*-value	IRR	*p*-value	IRR	*p*-value
Consumption						
LikeIt	1.280***	.000	1.341***	.000	1.212***	.000
Relax	1.150***	.000	1.169***	.000	1.125***	.000
Addiction	1.444***	.000	1.440***	.000	1.458***	.000
Feel Better	1.142***	.000	1.103***	.001	1.203***	.000
Peer	0.928***	.010	0.939	.155	0.917**	.025
Fashion	0.897**	.011	0.973	.679	0.844***	.003
Gender	1.075***	.000				
Age15	1.209***	.000	1.167***	.000	1.280***	.000
Age16	1.318***	.000	1.299***	.000	1.350***	.000
Age17	1.456***	.000	1.428***	.000	1.510***	.000
Age18	1.695***	.000	1.608***	.000	1.806***	.000
Housewife	1.001	.936	0.968**	.017	1.041***	.006
Without Father	1.200***	.000	1.195***	.000	1.205***	.000
Unemployed Father	1.037	.310	0.981	.674	1.137**	.029
Smoker Mother	1.097***	.000	1.097***	.000	1.098***	.000
Smoker Father	1.087***	.000	1.085***	.000	1.088***	.000
Smoker Sibling	1.088***	.000	1.104***	.000	1.069***	.000
University Mother	0.955***	.001	0.940***	.001	0.978	.285
University Father	0.994	.646	0.985	.415	1.000	.987
Information Campaign	0.981**	.049	0.977*	.082	0.988	.408
Intercept	3.501***	.000	3.506***	.000	3.700***	.000
	OR	*p*-value	OR	*p*-value	OR	*p*-value
Non-participation						
Gender	1.513***	.000				
Age15	0.510***	.000	0.535***	.000	0.474***	.000
Age16	0.369***	.000	0.397***	.000	0.329***	.000
Age17	0.212***	.000	0.229***	.000	0.191***	.000
Age18	0.161***	.000	0.172***	.000	0.146***	.000
Housewife	1.257***	.000	1.244***	.000	1.265***	.000
Without Father	0.753***	.000	0.698***	.000	0.832**	.018
Unemployed Father	1.343**	.019	1.259	.157	1.496**	.046
Smoker Mother	0.738***	.000	0.696***	.000	0.792***	.000
Smoker Father	0.837***	.000	0.838***	.000	0.837***	.000
Smoker Sibling	0.407***	.000	0.412***	.000	0.397***	.000
University Mother	1.113**	.019	1.188***	.006	1.031	.646
University Father	1.040	.367	1.038	.525	1.046	.481
Information Campaign	1.311***	.000	1.238***	.000	1.391***	.000
Intercept	5.441***	.000	5.438***	.000	8.495***	.000

Note. IRR: Incidence Rate Ratio; OR = Odds Ratio.

This paper also highlights the extent to which tobacco consumption is addictive. Thus, 25% of adolescents who currently smoke declare that they cannot give it up, and, according to the estimates, this group smokes 44% more cigarettes than the rest. This is in line with certain prior investigations that have pointed out the addictive nature of nicotine, stressing that the effect of this addictive force is more severe the earlier an adolescent takes up smoking (US Department of Health and Human Services, 1994). This is also borne out by studies recognizing that the nicotine content of tobacco makes smoking addictive—reinforced by the fact that people draw psychological comfort and reassurance from continuing to smoke (Prochaska, DiClemente, & Norcross, 1992; Suranovic, Goldfarb, & Leonard, 1999; Warner, 1986). Thus, although there could be some psychological dependence in addition to physical dependence, it is plausible to assume that limiting tar and nicotine content, and other substances that can cause physical dependence would reduce the number of smokers and the number of cigarettes consumed.

The remaining justifications for being a current smoker are social, but they are minority reasons. Thus, only a small number of adolescents report that they smoke because their peers do it, or because it is fashionable. This appears contrary to prior studies that have identified peer

smoking as an important predictor of smoking (Ali &
Dwyer, 2009; Duarte, Escario, & Molina, 2014a; Duarte,
Escario, & Molina, 2014b; Lundborg, 2006). One possible
explanation for this result is that adolescents under-report
peer and other social influences because they do not want
to recognize that their behavior follows that of others, thus
undermining their sense of independence. But, at the same
time, the low number of adolescents who report the peer
effect could be consistent with some studies that claim the
difficulty of estimating peer effects with cross-sectional
data (Manski, 1993; Scheinkman, 2008), or with other pa-
pers that review the empirical evidence and find mixed
evidence (McVicar, 2011), or that peer effects are not sig-
nificant under different statistical procedures (Duarte, Es-
cario, & Molina, 2014a; McVicar, 2011). In addition to
the finding that these social reasons are applicable to a re-
duced proportion of adolescents, these individuals appear
to smoke fewer cigarettes than their peers.

With respect to the rest of the family variables, it can be
seen that having a housewife mother and an unemployed
father increase the probability of being a nonsmoker, al-
though these characteristics do not exert a significant
influence on the level of consumption. While the father
studies level has a negligible effect on the probability of
being a non-smoker, and on the consumption level, having
a mother with a university education increases the proba-
bility of being a nonsmoker and reduces the level of con-
sumption.

Most notably, estimates suggest that smoking among
family members is an important determinant of smoking.
In this sense, the probability of being a nonsmoker is lower
for those whose parents are smokers. Moreover, having
two smoking parents implies a greater risk of becoming
a smoker than having only one smoking parent. There is
strong evidence of this result in the literature, where it
is known as the intergenerational transmission of smok-
ing (Ashley et al., 2008; Becoña et al., 2012; Melchior,
Chastang, Mackinnon, Galéra, & Fombonne, 2010; Van-
dewater et al., 2014). However, unlike prior research, that
only analyses the effect of parents smoking on the prob-
ability of children smoking, our work also estimates the
effects of having smoker parents on the level of cigarette
consumption. These estimates suggest that each smoker
parent increases the consumption level by around 9%
(9.7% for the mother and 8.7% for the father). Conse-
quently, our work is in line with the existing literature
that claims that visibility of smoking among adult role
models is an important predictor of adolescent smoking
(O'Loughlin et al., 2009), but we go further, finding that
this visibility of smoking among parents increases the
level of consumption.

All in all, this paper offers insights and implications
for parents, researchers, educators, and cessation interven-
tionists, as awareness of self-reported and other predictors
held by smoking youth creates a vantage point to facili-
tate smoking behavior change. In light of these results, it
would appear that parents giving up smoking before their
children reach adolescence could reduce the probability

that their children become smokers, and could also have
a positive effect reducing the level of consumption. At
the same time, informative campaigns at school at least
reduce the number of smokers, although their effect on
the number of cigarettes consumed is minor. Moreover,
policy interventions in attempts to reduce the attractive-
ness of smoking, and to control the addictive components
of tobacco, especially nicotine, will reduce the number
of cigarettes smoked and will facilitate some adolescents
kicking the habit.

DECLARATION OF INTEREST

The authors report no conflicts of interest. The authors
alone are responsible for the content and writing of the
article.

FUNDING

THE AUTHORS

Luis Borderías obtained a degree in Medicine at the University of Zaragoza (Spain). He specialized in Pneumology at the National Medical Center 'Marqués de Valdecilla' of the Cantabria University (Spain) (1982–1986) and received his Ph. D. in Medicine and Surgery from the University of Zaragoza (Spain) in 1996. Since 1990, plays the Head of the Unit of Pneumology in the Hospital General San Jorge (Huesca, Spain). He has been Associate Professor of Medicine in the Department of Medicine and Psychiatry at the University of Zaragoza and Secretary of the Area of Respiratory Infections and Tuberculosis belonging to the Respiratory Society Spanish. He is currently evaluator of scholarships and grants in the Area Biomedical Carlos III Institute (Ministry of Health Government of Spain) and the Spanish Society of Respiratory Pathology (SEPAR). The main areas of research are respiratory infections and asthma (epidemiology, genetics, clinical management, quality of care, and pharmacoeconomics), pulmonary drug toxicity and high altitude medicine. He also collaborates with the Department of Pathology, Faculty of Veterinary Medicine, University of Zaragoza in the development of animal models like the sheep lung adenocarcinoma triggered by virus. His work has been published in Clinical Infectious Diseases, Plos One, Journal Allergy and Clinical Immunology, American Journal Respiratory Critical Care Medicine, Chest, Thorax, European Respiratory Journal, Current Medical and Research Opinion, Critical Care, Critical Care Medicine, Intensive Care Medicine, Cancer Letter, Journal of Comparative Pathology, among others.

Rosa Duarte (PhD in Economics, University of Zaragoza 1999) is Associate Professor of Economic Theory (Microeconomics) at the Department of Economic Analysis, University of Zaragoza. Her lines of research include multisectorial modeling, environmental and resources economics, scenario analysis, structural and technological change, health and education economics and micro-econometrics. She has more than 15 years of experience in economic analysis and microeconomics. She is author of different articles on micro-econometrics and health economics and has participated on different projects focused on adolescent behavior, education, alcohol, and tobacco and drug consumption.

José Julián Escario, PhD in Economics, is an Associate Professor of Economic Theory and a Research Economist at the Department of Economic Analysis (University of Zaragoza, Spain). He has experience in econometric modeling of adolescent behavior and has participated in several projects that analyze education, tobacco, and alcohol consumption, drug use, and others behaviors among adolescents. His research interests focus mostly on the epidemiology of substance use and other unhealthy habits, with an emphasis on understanding the prevalence, correlates, and causes of these habits among adolescents. His work has been published in *Adicciones, Applied Economics, Economics of Education Review, Empirical Economics, and Journal of Policy Modelling,* among others.

Professor **José Alberto Molina** received his Ph. D. in Economics from the University of Zaragoza (Spain) in 1992. He joined IZA as a Research Fellow in September 2006. He has been Visiting Fellow at FEDEA (Madrid, Spain), at Warwick University (UK), at the University of Rhode Island (USA) and at the Boston College (USA). He is currently Associate Editor of *Applied Economics, Applied Economics Letters, International Journal of Consumer Studies, Journal of Family and Economic Issues* and *Review of Economics of the Household*. The main research area of Professor Molina is microeconomics and, particularly, household and population economics, labor economics and well-being, with specific interest in intra-household allocation and inter-generational transfers. He is also working on projects related to efficient bargaining in families with children and elderly. His work has been published in *Economic Modelling, Economics of Education Review, Empirical Economics, European Journal of Health Economics, Feminist Economics, Journal of Agricultural Economics, Journal of Policy Modelling, Journal of Population Economics, Journal of Transport Economics and Policy, Kyklos, PLOS ONE and Review of Economics of the Household*, among others.

ORCID

José Julián Escario http://orcid.org/0000-0003-0507-8758

REFERENCES

Ali, M. M., & Dwyer, D. S. (2009). Estimating peer effects in adolescent smoking behavior: A longitudinal analysis. *Journal of Adolescent Health*, *45*(4), 402–408. doi:http://dx.doi.org/10.1016/j.jadohealth.2009.02.004

Ashley, O. S., Penne, M. A., Loomis, K. M., Kan, M., Bauman, K. E., Aldridge, M., . . . Novak, S. P. (2008). Moderation of the association between parent and adolescent cigarette smoking by selected sociodemographic variables. *Addictive Behaviors*, *33*(9), 1227–1230. doi:10.1016/j.addbeh.2008.04.012

Becoña, E., Martínez, Ú., Calafat, A., Juan, M., Fernández-Hermida, J. R., & Secades-Villa, R. (2012). Parental styles and drug use: A review. *Drugs: Education, Prevention & Policy*, *19*(1), 1.

Boletin Oficial del Estado. (1999). Ley orgánica 15/1999, de 13 de diciembre, de protección de datos de carácter personal. BOE:1–21.

Comité Nacional para la Prevención del Tabaquismo. (1998). *Libro blanco sobre la prevención del tabaquismo en España (White book for tobacco prevention in Spain)*. Barcelona: GLOSA, SL.

Duarte, R., Escario, J. J., & Molina, J. A. (2014a). Are estimated peer effects on smoking robust? Evidence from adolescent students in Spain. *Empirical Economics*, *46*(3), 1167–1179. doi:10.1007/s00181–013–0704–7.

Duarte, R., Escario, J. J., & Molina, J. A. (2014b). Broader versus closer social interactions in smoking. *Mind and Society*, *13*(2), 183–194. doi:10.1007/s11299–013–0135–3

Foster, G., & Frijters, P. (2010). Students' beliefs about peer effects. *Economics Letters*, *108*(3), 260–263.

Höhne, B., Pabst, A., Hannemann, T. V., & Kraus, L. (2014). Patterns of concurrent alcohol, tobacco, and cannabis use in germany: Prevalence and correlates. *Drugs: Education, Prevention and Policy*, *21*(2), 102–109.

Kelly, A. B., O'Flaherty, M., Connor, J. P., Homel, R., Toumbourou, J. W., Patton, G. C., & Williams, J. (2011). The influence of parents, siblings and peers on pre- and early-teen smoking: A multilevel model. *Drug and Alcohol Review*, *30*(4), 381–387.

Lundborg, P. (2006). Having the wrong friends? Peer effects in adolescent substance use. *Journal of Health Economics*, *25*(2), 214–233. doi:10.1016/j.jhealeco.2005.02.001

Manski, C. (1993). Identification of endogenous social effects: The reflection problem. *Review of Economic Studies*, *60*(3), 531–542. doi:10.2307/2298123

McVicar, D. (2011). Estimates of peer effects in adolescent smoking across twenty six European countries. *Social Science & Medicine*, *73*(8), 1186–1193. doi:10.1016/j.socscimed.2011.08.006

Melchior, M., Chastang, J. F., Mackinnon, D., Galéra, C., & Fombonne, E. (2010). The intergenerational transmission of tobacco smoking- the role of parents' long-term smoking trajectories. *Drug and Alcohol Dependence*, *107*(2–3), 257–260. doi:10.1016/j.drugalcdep.2009.10.016

O'Loughlin, J., Karp, I., Koulis, T., Paradis, G., & Difranza, J. (2009). Determinants of first puff and daily cigarette smoking in adolescents. *American Journal of Epidemiology*, *170*(5), 585–597.

Piko, B. F., & Balázs, M. Á. (2012). Authoritative parenting style and adolescent smoking and drinking. *Addictive Behaviors*, *37*(3), 353–356.

Precht, D. H., Keiding, L., Nielsen, G. A., & Madsen, M. (2006). Smoking among upper secondary pupils with asthma: Reasons for their smoking behavior: A population-based study. *Journal of Adolescent Health*, *39*(1), 141–143. doi:http://dx.doi.org/10.1016/j.jadohealth.2005.10.012

Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change: Applications to addictive behaviors. *American Psychologist*, *47*(9), 1102–1114.

Ramon Torrell, J. M., Bruguera Cortada, E., Fernández Pinilla, C., Sanz de Burgoa, V., & Ramírez Vázquez, E. (2009). Reasons for smoking cessation in Spain by gender and age. [Motivos para dejar de fumar en España en función del sexo y la edad] *Gaceta Sanitaria*, *23*(6), 539.e1–539.e6.

Scheinkman, J. A. (2008). Social interactions (theory) In S. Durlauf, & L. Blume (eds.), *New palgrave dictionary of economics* (2nd ed.). London, UK: Palgrave Macmillan.

Smith, B. J., Phongsavan, P., Bauman, A. E., Havea, D., & Chey, T. (2007). Comparison of tobacco, alcohol and illegal drug usage among school students in three Pacific Island societies. *Drug and Alcohol Dependence*, *88*(1), 9–18. doi:10.1016/j.drugalcdep.2006.08.030

Suranovic, S. M., Goldfarb, R. S., & Leonard, T. C. (1999). An economic theory of cigarette addiction. *Journal of Health Economics*, *18*(1), 1–29.

US Department of Health and Human Services. (1994). *Preventing tobacco use among young people: A report of the Surgeon General.* Washington, DC: Author.

Vandewater, E. A., Park, S. E., Carey, F. R., & Wilkinson, A. V. (2014). Intergenerational transfer of smoking across three generations and forty-five years. *Nicotine & Tobacco Research*, *16*(1), 11–17. doi:DOI:10.1093/ntr/ntt112

Warner, K. E. (1986). Smoking and health implications of a change in the federal cigarette excise tax. *Journal of the American Medical Association*, *255*(8), 1028–1032.

Wileyto, P., O'Loughlin, J., Lagerlund, M., Meshefedjian, G., Dugas, E., & Gervais, A. (2009). Distinguishing risk factors for the onset of cravings, withdrawal symptoms and tolerance in novice adolescent smokers. *Tobacco Control*, *18*(5), 387–392.

Winkelmann, R. (2008). *Econometric analysis of count data* (Fourth ed.). Berlin: Springer-Verlag.

World Medical Association. (2000). Declaration of Helsinki. Ethical principles for medical research involving human subjects, amended by 52nd WMA General Assembly, Edinburgh, Scotland, October 2000.