

# Smokers' compliance with smoke-free policies, and non-smokers' assertiveness for smoke-free air in the workplace: a study from the Balkans

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## Abstract

**Objective** Identify the psychosocial variables that predict smokers' compliance with smoke-free policies at work, and non-smokers' assertiveness for smoke-free rights in Greek and Bulgarian workplaces.

**Methods** Data were collected from employees in Greece and Bulgaria. The main outcome measures were smokers' compliance with smoke-free policies, and non-smokers' assertiveness intentions. Demographic variables, tobacco use and dependence, as well as beliefs about second-hand smoke (SHS) exposure and smoking at work were also assessed.

**Results** Regression analyses showed that smokers' compliance with smoke-free policies was predicted by age, perceived health risks of smoking, and beliefs related to the benefits of smoking at work. Non-smokers' assertiveness was predicted by annoyance from exposure to SHS at work, and assertiveness-related social cognitions (e.g., attitudes, social norms, and self-efficacy).

**Conclusions** Interventions to promote support for tobacco control policies at work in Greece and Bulgaria may benefit from targeting smokers' beliefs about the actual effects of tobacco use on health and job performance. Accordingly, efforts to promote non-smokers assertiveness should build

stronger assertiveness-related attitudes, convey anti-smoking normative messages, and strengthen self-efficacy skills.

**Keywords** Assertiveness · Compliance · Workplace smoking · Greece · Bulgaria · SHS exposure

## Introduction

Exposure to second-hand smoke (SHS), also termed passive smoking, is a major threat to public health. Several studies have shown that exposure to SHS is causally linked to cardiovascular problems, respiratory diseases, and certain types of cancer (Barnoya and Glantz 2005). In response to this public health threat more than 130 countries around the world have endorsed the Framework Convention on Tobacco Control (FCTC), which mandates the use of measures against exposure to SHS in public places and work settings, such as the implementation of smoke-free policies (West 2006). Several studies have shown that smoke-free policies at work can reduce the amount of cigarettes smoked and increase quitting behavior by eliminating pro-smoking cues, and encouraging cessation among smokers (e.g., Fichtenberg and Glantz 2002; Halpern and Taylor 2010).

## Smokers' compliance with smoking bans

Smoke-free policies promote social unacceptability of tobacco use in public settings (Fichtenberg and Glantz 2002; Thrasher et al. 2009), but some smokers may be unwilling to comply. Smokers' compliance with smoke-free policies represents a key variable that should be taken into account by public health policy makers (Lazuras et al. 2009). Relevant research has been scarce and the available

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studies have focused largely on smokers' attitudes and acceptance of smoking bans (e.g., Poland et al. 2000; Schumann et al. 2006), and less on smokers' actual behavioral responses. A recent study showed that smokers' reported non-compliance with smoking bans was significantly associated with greater perceived social acceptability of tobacco use, and less regret from harming non-smokers' health through exposure to SHS (Lazuras et al. 2009).

#### Non-smokers' reactions when smokers smoke

Non-smokers may protect themselves individually by asserting their right for smoke-free air, especially in cases where smokers smoke in non-designated areas (Germain et al. 2007). One of the first studies on this topic showed that about half of non-smokers in a sample of Dutch companies intended to be assertive and had asked smokers not to smoke (Willemsen and De Vries 1996). Further research indicated several psychosocial predictors of assertiveness, including the perception that other non-smokers are assertive (social norms), and having the confidence to act assertively when smokers light up their cigarettes (self-efficacy; Aspropoulos et al. 2010). Finally, Germain et al. (2007) showed that, among Australian non-smokers, greater concern about the health effects of exposure to SHS was linked to acting assertively and asking smokers not to smoke.

#### The present study

Smokers' non-compliance with smoking restrictions is more common in countries lacking comprehensive and effective tobacco control policies, and legislative measures against SHS exposure. According to Eurobarometer estimates, Greece and Bulgaria top the list of the countries with the highest smoking rates in Europe (42 and 36%, respectively; Bogdanovica et al. 2011), and high rates of exposure to SHS are reported (Baska et al. 2009). In addition, although both Greece and Bulgaria are members of the FCTC, they lag behind other FCTC countries in effectively reducing tobacco use and exposure to SHS (Joosens and Raw 2007). However, Bulgaria appears to be more active than Greece in implementing smoke-free policies. Evidently, in these countries it is important to examine the degree to which smokers comply with existing smoking restrictions in public settings, as well as non-smokers' readiness to assert their rights for smoke-free air. For this purpose, the present study set out to identify the psychosocial variables that predict (a) smokers' compliance with smoke-free policies at work, and (b) non-smokers' assertiveness for smoke-free rights in Greek and Bulgarian workplaces. Based on previous research (e.g.,

Aspropoulos et al. 2010; Lazuras et al. 2009; Willemsen and De Vries 1996) a behavioral model was employed, which took into account the effects of social norms, attitudes, self-efficacy, and concern about the health effects of exposure to SHS. Additional demographic variables were also accounted for, in order to provide a more thorough understanding of the range of influences on compliance and assertiveness behavior.

## Methods

### Participants and procedure

A two-stage sampling approach was utilized. At the first stage, three companies from Greece and seven companies from Bulgaria were randomly selected from a database of companies in the regions of Thessaloniki (second largest city in Greece) and Sofia (capital city of Bulgaria). Of them, two companies from Greece (66.6% response rate) and six companies from Bulgaria (85.7% response rate) agreed to take part in the study. The Greek companies were from the telecommunications and banking industry, and the Bulgarian companies came from construction works, communication and mass media, and the energy industry. The selected companies had either a total or a partial ban in place, but this was not an eligibility criterion for participation, and was determined after the companies agreed to participate in the study. At the second stage, all indoor office employees from the selected companies were eligible to participate, independently of their smoking status or any other criteria. In each country, the study took place following the permission of the human resources departments, the employees were approached by members of the research team, and there were no incentives or compensation for participation in the study. Specifically, 300 employees from the two Greek companies based in Thessaloniki were approached, and 199 agreed to participate (response rate = 66.3%), and 35.4% ( $n = 70$ ) of them were females. In Bulgaria, 329 employees from six companies in Sofia were approached and 183 participated in the study (response rate = 55.6%). Of them, 61.5% ( $n = 112$ ) were females. Following international guidelines for research ethics, participation was voluntary and all participants were informed about the purposes of the study. The questionnaires were anonymous and were distributed to personnel of the companies by one researcher or the administrative staff of the company. Ethics approval was granted by the Ethics Committees of the University of Sheffield and City College. No time limits were imposed and questionnaires were completed on site during regular working hours.

## Measures

The same measures were used in both the Greek and Bulgarian surveys, and we used bilinguals from each country to ensure equivalence in the wording and meaning of the items and response options. All measures were included in a single questionnaire, but for reasons of clarity, they are presented in three parts as follows. The first part consisted of measures that were common to smokers and non-smokers, such as demographic characteristics (e.g., age, gender), smoking status (non-smoker, past smoker, occasional smoker, and smoker); perceived health risks from exposure to SHS at work (e.g., asthma, lung cancer, heart disease, bronchitis, respiratory problems); and social norms regarding non-smokers' assertiveness at work (see Aspropoulos et al. 2010; Lazuras et al. 2009).

The second part consisted of measures focusing specifically on smokers' compliance behavior. These included compliance with smoking restrictions in smoke-free sectors at work, tobacco dependence (measured with Heaviness of Smoking Index (HSI), a short form of Fagerstrom's tolerance questionnaire; Heatherton et al. 1991, 1989), quit intentions (in the next 30 days, in 6 months, after 6 months, or no intentions to quit), perceived health risk from smoking (the likelihood of tobacco-related health risk from one's own smoking, and from passive smoking), and perceived benefits of smoking at work (i.e., individual and social benefits of smoking while working, such as pleasure, peer acceptance, improved performance, calm and relaxation, concentration, socialization, beating boredom).

The third part included measures relevant only to non-smokers' assertiveness at work (see Aspropoulos et al. 2010). These included attitude towards assertiveness (e.g., is asking your smoker colleagues not to smoke in your working area good or bad?), self-efficacy to act assertively against SHS exposure at work (i.e., ease of asking a smoker colleague not to smoke in the workspace), outcome efficacy (i.e., the belief that being assertive will lead to the desirable outcome), perceived annoyance from SHS exposure at work, and behavioral responses to SHS exposure at work (e.g., moving away from smokers). Responses were recorded using 5-point Likert scales. All the multi-item continuous measures used had acceptable internal consistency reliability scores (Cronbach's  $\alpha > 0.70$ ).

## Results

The means, standard deviations, and intercorrelations among the study variables are presented in Tables 1 and 2 for Greece and Bulgaria, respectively.

## Smoking status and current worksite smoking policies

Overall, 41.3% of Greek employees reported daily or weekly smoking, 14.7% had given up, and 44.0% said they never tried smoking in their lifetime. Similarly, almost half (48.2%) of the Bulgarian employees reported smoking on a daily or weekly basis, whereas 19.2% had quit smoking, and 32.6% were never smokers.

## Smokers' compliance with smoking bans

Only data from daily smokers were used to estimate the prevalence and the correlates of compliance behavior. This was done because smoking bans are likely to affect daily smokers more than weekly (or less than weekly) smokers, who happen to smoke on an occasional basis. Thus, unlike daily smokers, occasional smokers may refrain from smoking for longer periods and not feel restricted by smoke-free policies at work.

In Greece, the daily smokers who reported that they never smoked in smoke-free areas at work were 43.2%, whereas those reporting smoking in smoke-free areas rarely or sometimes were 39.2%. Still 17.6% reported they smoked in smoke-free areas either often or almost always. In Bulgaria, more than half of daily smokers (58%) reported they never smoked in non-designated areas, 36.2% said they smoked rarely or sometimes, and only 5.7% reported smoking often or almost always in smoke-free zones. Independent samples' *t* test showed that the differences in the mean scores of smokers' self-reported compliance with smoking bans at work between Greece ( $M = 2.08$ ,  $SD = 1.21$ ) and Bulgaria ( $M = 1.67$ ,  $SD = 0.95$ ) were statistically significant ( $t(140) = 2.26$ ,  $p < 0.05$ ).

Stepwise linear regression analyses were used to identify the psychosocial predictors of smokers' compliance with smoking bans at work in each country. Predictor variables included demographic characteristics (i.e., age, gender), nicotine dependence (HSI score) and quit intentions, perceived prevalence of assertive non-smokers in the company, beliefs about the health risks of smoking and the effects of exposure to SHS, and perceived benefits of smoking at work (Table 3).

Regarding the Greek data, the overall model was significant and explained (Adj  $R^2$ ) 34.6% of the variance in compliance behavior ( $F(2, 50) = 14.19$ ,  $p < 0.001$ ). The only significant predictors were age ( $\beta = 0.456$ ,  $p < 0.05$ ) and perceived benefits of smoking at work ( $\beta = 0.291$ ,  $p < 0.05$ ). The same analysis with the same set of predictor variables was computed for the Bulgarian sample. The regression model was significant and explained (Adj  $R^2$ ) 15.3% of the variance in compliance behavior ( $F(2, 50) = 5.50$ ,  $p < 0.05$ ). The only significant predictors of

**Table 1** Means, standard deviations, and intercorrelations among the study variables (Greece), November 2008–May 2009

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	–	–0.58*	0.33*	0.07	0.51*	0.03	0.27*	0.20*	–0.09	0.52*	0.09	–0.04	–0.10	–0.09	0.34*
2. Gender		–	–0.25*	0.05	–0.31*	0.21	–0.50	–0.17*	0.15*	–0.27*	0.08	0.06	0.21*	0.11	–0.12
3. HSI score			–	0.02	0.39*	–0.29*	0.42*	–0.07	–0.17	0.05	0.04	–0.12	–0.31*	–0.34*	–0.08
4. Quit intentions				–	0.11	–0.07	0.21	–0.13	–0.11	–0.06	–0.09	0.14	–0.09	–0.12	–0.07
5. Compliance behavior					–	–0.09	0.36*	–0.31*	–0.02	0.27*	0.27*	–0.09	–0.34*	–0.28*	–0.13
6. Health risks (smoking)						–	–0.21	0.14	0.33*	0.30*	–0.02	0.23	0.60*	0.39*	0.30*
7. Perceived benefits of smoking							–	–0.35*	–0.28*	0.09	0.36*	–0.25*	–0.47*	–0.24*	–0.11
8. Assertiveness intentions								–	0.27*	0.29*	–0.33*	–0.11	0.21*	0.43*	0.43*
9. Assertiveness attitudes									–	0.07	–0.14*	–0.06	0.22*	0.30*	0.17*
10. Assertiveness norms										–	0.13	–0.06	–0.03	0.12	0.39*
11. Assertiveness self-efficacy											–	–0.07	–0.13	0.02	0.11
12. Outcome efficacy												–	0.09	–0.07	–0.11
13. Health risk (SHS)													–	0.21*	0.17*
14. Annoyance														–	0.45*
15. Response to SHS Exposure															–
Mean	36.8	–	2.10	3.12	2.08	3.66	2.84	3.35	3.90	2.80	2.51	3.28	3.91	3.16	2.17
SD	13	–	1.57	0.76	1.21	0.89	0.78	1.31	1.15	1.04	1.04	0.81	0.62	1.41	1.16

SHS Second-Hand Smoke, HSI Heaviness of Smoking Index

\*  $p < 0.05$

smokers' compliance with the smoking ban at work were gender ( $\beta = 0.328$ ,  $p < 0.05$ ) and perceived health risk of smoking ( $\beta = -0.337$ ,  $p < 0.05$ ).

#### Non-smokers' assertiveness

In Greece, almost half of the non-smoker employees (49.1%) reported they either never or rarely asked smokers not to smoke in their working area, 20.9% were assertive sometimes, whereas 30% said they were assertive often or almost always. In Bulgaria, 63.6% of non-smoker employees either never or rarely asked a smoker not to smoke in their working area, 18.1% were sometimes assertive, and 18.4% said they were often or almost always assertive. Independent samples  $t$  test showed that Greek and Bulgarian non-smoker employees did not differ significantly in their mean scores of assertiveness behavior. However, Bulgarian non-smoker employees had significantly higher mean scores in intentions to be assertive in the future ( $M_{\text{Greece}} = 3.63$ ,  $M_{\text{Bulgaria}} = 3.96$ ,  $t(206) = 2.03$ ,  $p < 0.05$ ).

Two stepwise linear regression analyses were used to identify the psychosocial predictors of non-smokers'

assertiveness intentions in Greece and Bulgaria, respectively (Table 4). The selection of predictors was based on previous studies in the area (e.g., Aspropoulos et al. 2010; Willemsen and De Vries 1996), and included demographic variables (age and gender), attitudes, social norms, self-efficacy, outcome efficacy SHS health beliefs, annoyance from exposure to SHS, and response to SHS exposure at work. In the Greek sample, the regression model was significant and predicted 48.6% of the variance in assertiveness intentions ( $F(5, 98) = 19.56$ ,  $p < 0.001$ ). The significant predictors were age, assertiveness-related attitudes, norms (i.e., believing that most of other non-smoker colleagues are assertive), self-efficacy (i.e., believing that it is easy to ask a smoker colleague not to smoke), and hindrance (annoyance) from exposure to SHS at work. In the Bulgarian sample a significant regression model also emerged predicting 27.6% of the variance in assertiveness intentions ( $F(5, 98) = 9.89$ ,  $p < 0.001$ ), and the significant predictors were assertiveness attitudes and outcome efficacy (i.e., believing that asking smokers not to smoke will lead to the desirable outcome), and annoyance from SHS exposure.

**Table 2** Means, standard deviations, and intercorrelations among the study variables (Bulgaria), November 2008–May 2009

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	–	–0.02	0.24*	0.28*	0.08	–0.28*	0.00	0.09	0.08	0.04	0.04	0.07	–0.09	0.06	0.09
2. Gender		–	–0.23	–0.13	0.07	0.23	–0.04	–0.11	–0.01	–0.10	0.01	–0.03	0.24*	0.08	–0.05
3. HSI score			–	0.33*	0.32*	–0.28*	0.34*	–0.36*	–0.21	0.11	0.01	–0.07	–0.58*	–0.18	0.03
4. Quit intentions				–	0.09	–0.27*	0.18	–0.03	–0.21	0.15	0.01	–0.17	–0.10	–0.00	0.04
5. Compliance behavior					–	–0.19	0.13	–0.07	–0.09	–0.19	0.08	–0.00	–0.11	–0.07	–0.11
6. Health risks (smoking)						–	–0.12	0.24*	0.28*	–0.08	–0.04	–0.13	0.62*	0.23	0.05
7. Perceived benefits of smoking							–	–0.17	–0.26*	–0.14	0.29*	–0.03	–0.09	–0.25*	0.08
8. Assertiveness intentions								–	0.46*	0.27*	–0.22*	0.21	0.24*	0.33*	0.23*
9. Assertiveness attitudes									–	0.32*	–0.27	0.12	0.11	0.33*	0.25*
10. Assertiveness norms										–	–0.01	–0.04	0.04	0.28*	0.27*
11. Assertiveness self-efficacy											–	–0.34*	0.07	0.07	0.11
12. Outcome efficacy												–	–0.10	–0.18*	–0.23*
13. Health risk (SHS)													–	0.33*	0.16*
14. Annoyance														–	0.47*
15. Response to SHS Exposure															–
Mean	37.7	–	1.81	2.93	1.67	3.85	2.50	3.69	4.03	2.58	2.26	3.59	3.72	2.80	1.97
SD	13	–	1.62	0.84	0.95	0.90	0.73	1.32	0.86	1.02	1.08	0.88	0.71	1.57	1.23

SHS Second-Hand Smoke, HSI Heaviness of Smoking Index

\*  $p < 0.05$

**Table 3** Psychosocial predictors of self-reported compliance behavior in Greece and Bulgaria, November 2008–May 2009

Country	Greece ( $n = 74$ )		Bulgaria ( $n = 70$ )	
	$\beta$	Adj $R^2$	$\beta$	Adj $R^2$
Gender	–0.038	0.346	0.328**	0.153
Age	0.456**		0.094	
HSI score	0.186		0.249	
Quit intentions	0.025		0.132	
Assertiveness norms	0.109		–0.127	
Health risk from SHS exposure	–0.134		0.007	
Health risks of smoking	–0.070		–0.337**	
Perceived benefits of smoking at work	0.291*		0.222	

SHS Second-Hand Smoke, HSI Heaviness of Smoking Index

\*  $p < 0.05$ ; \*\*  $p < 0.005$

**Table 4** Psychosocial predictors of non-smokers' assertiveness in Greece and Bulgaria, November 2008–May 2009

Country	Greece ( $n = 110$ )		Bulgaria ( $n = 98$ )	
	$\beta$	Adj $R^2$	$\beta$	Adj $R^2$
Gender	0.020	0.486	–0.172	0.276
Age	0.300**		0.126	
Assertiveness attitudes	0.210*		0.262**	
Assertiveness norms	0.196*		0.143	
Assertiveness self-efficacy	–0.413**		–0.148	
Assertiveness outcome efficacy	–0.032		0.413**	
Health risk from SHS exposure	0.123		–0.068	
Annoyance from SHS exposure	0.297**		0.310**	
Response to SHS exposure	–0.032		0.099	

SHS Second-Hand Smoke, HSI Heaviness of Smoking Index

\*  $p < 0.05$ ; \*\*  $p < 0.005$

## Discussion

The present study addressed two rather important tobacco control issues, namely smokers' compliance with smoking bans, and non-smokers' assertiveness for smoke-free air in the workplace. With respect to compliance behavior, the results showed that significantly more Greek daily smoker employees reported that they systematically violated existing smoking restrictions at work, as compared to Bulgarian employees. In the Greek sample, the employees who reported violation of indoor smoke-free policies tended to be older, and more in defense about the benefits of smoking at work. One possible explanation of the age effect is that the more senior smoker employees are not aware, or have poor knowledge, of the negative impact of SHS exposure on health. This assumption is supported by the marginally significant negative correlation ( $r = -0.27$ ,  $p < 0.05$ , not reported in the results section) between age and perceived health risk from SHS exposure among Greek smoker employees. Although the perceived benefits at work reflect a newly introduced variable in the study of smokers' compliance with smoke-free policies, it seems to play a significant role, and therefore, requires further examination and integration into related theoretical approaches. Regarding the Bulgarian sample, findings showed that violation of the smoking ban was more common by female employees, and by smokers who tended to believe that tobacco use is relatively harmless. We did not have sufficient data to examine the gender effect in more detail, and recommend that this is studied in future research, perhaps with the use of qualitative methods (to achieve greater insight), or mixed methods designs. Overall, it seems that interventions to promote support for tobacco control policies at work in these two countries should target smokers' beliefs about the actual effects of tobacco use on health and job performance. Nevertheless, given the small sample of companies we used this argument merits further research.

Regarding non-smokers' assertiveness, the present findings showed that although Greeks and Bulgarians did not differ in self-reported assertiveness (i.e., how often they told smokers not to smoke) the latter group was significantly more willing to be assertive in the future. In Greece stronger assertiveness intentions were predicted by older age, greater annoyance from SHS exposure, more positive attitudes towards assertiveness, social norms (i.e., believing that most of the fellow colleagues who do not smoke are also assertive), and self-efficacy (i.e., asking smokers not to smoke is an easy thing to do). In the Bulgarian sample, assertiveness intentions were predicted only by attitudes, annoyance from exposure to SHS, and the belief that being assertive will indeed lead to the desirable outcome (i.e., smokers will put out their cigarette). These social

cognitions (i.e., attitudes, social norms, and self-efficacy beliefs) have been found to predict non-smokers' assertiveness at work in previous studies in Greece and the Netherlands (e.g., Aspropoulos et al. 2010; Willemsen and De Vries 1996). Thus, efforts to convey anti-smoking normative messages and strengthen self-efficacy skills can empower non-smokers to be more assertive.

The present findings are not free of limitations. Firstly, larger and more representative samples would make results more generalizable and allow drawing safer conclusions regarding the effect sizes of the regression models. Furthermore, additional predictors could be included, especially in relation to demographic characteristics (e.g., seniority/tenure, SES). Thirdly, measures of air quality could also be used to verify self-reported exposure to SHS at work. Finally, intentions do not always lead to actions (Webb and Sheeran 2006), hence a follow-up study is needed to determine whether assertiveness intentions transformed into assertiveness behavior. Notwithstanding these limitations, it should be noted that this is among the first studies to tap both issues of smokers' compliance and non-smokers' assertiveness in countries with high smoking rates. Thus, it sets the basis for future policy-making-oriented research and provides the theoretical paradigms on which future studies may develop and test their hypotheses. This is very important given that the topics of compliance and assertiveness are largely atheoretical in nature, and comparably underrepresented in the international public health literature.

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