Original Investigation

Smoke-free policies and the social acceptability of smoking in Uruguay and Mexico: Findings from the International Tobacco Control Policy Evaluation Project

James F. Thrasher, Marcelo Boado, Ernesto M. Sebríe, & Eduardo Bianco

Abstract

Introduction: Little research has been conducted to determine the psychosocial and behavioral impacts of smoke-free policies in middle-income countries.

Methods: Cross-sectional data were analyzed from the 2006 waves of the International Tobacco Control Policy Evaluation. Survey comparing adult smokers in Mexico ($n = 1,080$), where smoke-free legislation at that time was weak, and Uruguay ($n = 1,002$), where comprehensive smoke-free legislation was implemented. Analyses aimed to determine whether exposure to smoke-free policies and perceived antismoking social norms were associated with smokers' receiving cues about the bothersome nature of secondhand smoke (SHS), with smokers' reactance against such cues, and with smokers' level of support for smoke-free policies in different venues.

Results: In bivariate analyses, Uruguayan smokers were more likely than Mexican smokers to experience verbal anti-SHS cues, lower reactance against anti-SHS cues, stronger antismoking societal norms, and stronger support for 100% smoke-free policies in enclosed workplaces, restaurants, and bars. In multivariate models for both countries, the strength of voluntary smoke-free policies at home was independently associated with support for smoke-free policies across all venues queried, except for in bars among Uruguayans. Perceived strength of familial antismoking norms was consistently associated with all indicators of the social acceptability of smoking in Uruguay but only with the frequency of receiving anti-SHS verbal cues in Mexico.

Discussion: These results are generally consistent with previous research indicating that comprehensive smoke-free policies

are likely to increase the social unacceptability of smoking and that resistance against such policies is likely to diminish once such policies are in place.

Introduction

Smoke-free policy is a cornerstone of the World Health Organization Framework Convention on Tobacco Control, an international treaty that promotes best practices for tobacco control policies around the world (World Health Organization, 2003). In high-income countries, smoke-free policies have reduced involuntary exposure to toxic secondhand tobacco smoke, reduced tobacco consumption, and promoted quitting (Brownson, Hopkins, & Wakefield, 2002; Fichtenberg & Glantz, 2002). Although smokers' respect for the law may account for such changes, smoke-free laws presumably reflect and communicate social norms around smoking behavior in public places, and research has generally focused on how smoke-free policies change smokers' behavior by decreasing the social acceptability of smoking (Hamilton, Biener, & Brennan, 2008; Jacobson & Zapawa, 2001; Wasserman, Manning, Newhouse, & Winkler, 1991). Nevertheless, efforts to illustrate empirically that smoke-free policies reduce the social acceptability of smoking have provided inconsistent results (Biener, Abrams, Follick, & Dean, 1989; Biener et al., 1999; Gottlieb, Eriksen, Lovato, Weinstein, & Green, 1990; Hamilton et al., 2008). Moreover, little research has been undertaken to determine the psychosocial and behavioral impacts of smoke-free policies in low- and middle-income countries, where tobacco-attributable mortality is increasing (Mathers & Loncar, 2006).

Smoke-free policies in Mexico and Uruguay contrasted strikingly at the time of data collection for the present study.

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Uruguay's 2006 comprehensive smoke-free policy prohibited smoking in all enclosed workplaces including restaurants and bars, whereas Mexico smoke-free policy at that time was limited mainly to government buildings and hospitals (Thrasher et al., 2006). Nevertheless, polling data from Mexico and Uruguay indicate widespread public support for smoke-free policies. In 2006, after smoke-free policy implementation in Uruguay, 92% of urban Uruguayan adults indicated that secondhand smoke (SHS) was dangerous and 80% were in favor of the law (Sebrié, Schoj, & Glantz, 2008). Polls conducted among urban-dwelling adults in Mexico in 2007 indicated similarly high levels of support for smoke-free policies (80%–83%) in enclosed public areas and workplaces (Abundis, 2008). Slightly higher levels of support for smoke-free policies have been found among Mexican youth (Bird et al., 2007), with the percentage of urban youth supporting smoke-free policies increasing from 2003 to 2006 (Valdés-Salgado et al., 2006). No analyses have been undertaken in either Mexico or Uruguay to assess which factors predict support for smoke-free policies or to assess other attitudinal and normative factors that are presumably associated with smoke-free policies. Furthermore, no data are available on the prevalence of voluntary smoke-free policies either in Mexico or in Uruguay before smoke-free policy implementation.

The present study of adult smokers in Mexico and Uruguay aimed to determine whether smokers' exposure to smoke-free policies was associated with receiving antismoking cues from others, with reactance against such cues, and with level of support for smoke-free policies in different venues. The results from this study will help clarify whether smoke-free policies are associated with smoking-related attitudes, norms, and behaviors across sociocultural and political contexts (Fong, Cummings et al., 2006; MacKinnon, Taborga, & Morgan-Lopez, 2002).

Policies that create smoke-free public spaces appear to promote smoking cessation by decreasing the social acceptability of smoking (Jacobson & Zapawa, 2001; Wasserman et al., 1991). Among adult smokers in the United States, the United Kingdom, Australia, and Canada, baseline self-reported exposure to stronger smoke-free policies in restaurants and workplaces was associated with stronger baseline antismoking norms, which in turn predicted having quit after 9 months (Hammond, Fong, Zanna, Thrasher, & Borland, 2006). In another study, adult smokers who lived in U.S. towns with stronger smoke-free restaurant and bar policies viewed smoking in restaurants as less socially acceptable than did smokers in towns with weaker policies (Albers, Siegel, Cheng, Biener, & Rigotti, 2007). A different study using the same data derived a composite index of smoke-free and youth access policies in local communities, finding that the combined strength of these policies was positively associated with adults' and youths' perceptions of antismoking norms (Hamilton et al., 2008). However, results from longitudinal studies have yielded inconsistent or null results when assessing changes in social norms after smoke-free policies are implemented. For example, workplace smoke-free policies have not caused expected changes in smokers' perceptions of whether their coworkers disapprove of smoking or encourage them to quit (Biener et al., 1989, 1999; Gottlieb et al., 1990). If smoke-free policies successfully displace smoking to areas beyond the purview of nonsmokers, then these policies may actually reduce opportunities for people to offer smokers cues to quit (Gottlieb et al., 1990).

Smoke-free policies may nevertheless embolden some people to tell smokers not to smoke when they share the same space. Focus groups and surveys in California indicate that Latinos are reluctant to ask people not to smoke when with them, a predisposition that researchers suggest comes from Latinos' cultural emphasis on harmonious social interactions and avoidance of disagreement, particularly in public (Baezconde-Garbanati, Portugal, Barahona, & Carrasco, 2007). This cultural orientation also appears to help explain why self-reported SHS exposure at work is higher among Latinos than among other ethnic groups in California, even though Latinos have the highest prevalence of smoke-free homes (Baezconde-Garbanati, Beebe, & Perez-Stable, 2007; Baezconde-Garbanati, Portugal, et al., 2007). Nevertheless, Latino focus group participants indicated that having clear, widely understood smoke-free policies would provide support for their requests that others not smoke, mitigating the social risk of their being viewed as lacking *simpatía*, as unpleasant (e.g., *antipático*), or as antagonistic (e.g., *agresivo*; Thrasher et al., 2008). Hence, smoke-free policies could help some people overcome any reluctance they might have about asking smokers not to smoke around them.

Smoke-free policies limit where smokers can smoke. Smokers who perceive smoke-free policies as threatening their freedom to smoke where they choose may experience psychological reactance, a state of arousal that motivates attempts to reestablish the threatened freedom (S. S. Brehm & J. W. Brehm, 1981). To the extent that smoke-free policies produce psychological reactance, they are also likely to promote resistance against these bans. Such concerns are implicitly registered when efforts to promote smoke-free policies focus on the rights of nonsmokers to breathe clean air, while downplaying how such policies restrict the behavior of smokers. However, to our knowledge, no studies have assessed smokers' reactance when encountering either smoke-free places or requests from others that they not smoke.

Data from high-income countries indicate that any resistance to smoke-free policies dissipates over time. Among smokers and nonsmokers alike, support for smoke-free areas has been shown to increase after policy implementation (Fong, Hyland et al., 2006; Gorini, Chellini, & Galeone, 2007) or to remain unchanged (Biener, Garrett, Skeer, Siegel, & Connolly, 2007). Furthermore, exposure to smoke-free policies in some public places has been shown to generate support for smoke-free policies in other public places (Borland, Yong, Siapush, et al., 2006) and has led smokers to institute voluntary smoke-free home policies (Borland, Yong, Cummings, et al., 2006). The snowball effect of smoke-free policies helps explain why the World Health Organization has emphasized smoke-free policies as a cornerstone for tobacco control policy. Nevertheless, it is important to assess whether these effects generalize to the low- and middle-income countries that increasingly bear the burden of tobacco-attributable mortality.

Methods

Study sample

Data were drawn from the 2006 Uruguay and Mexico survey administrations of the International Tobacco Control Policy Evaluation (ITC) Project, an international effort to understand

tobacco policy impacts among cohorts of adult smokers in different countries (Fong, Cummings et al., 2006; Thrasher et al., 2006). Both the ITC-Mexico and ITC-Uruguay samples involved a multistage sampling scheme within selected cities (i.e., Montevideo in Uruguay Mexico City, Guadalajara, Tijuana, and Ciudad Juárez in Mexico). For each city, *manzanas* (i.e., block groups) were randomly selected, with selection probability proportional to the number of households according to the 2000 census. In ITC-Mexico, there was a quota of seven interviews per *manzana*, and if this quota was not reached, an additional *manzana* was randomly selected from the same *Área Geoestadística Básica* (i.e., census tract). Households within each selected *manzana* were visited in random order, with up to four visits on distinct days (two weekend days and two weekdays) and at different times of day. Once contact was made with an adult household member, households were enumerated and eligible smokers identified. A maximum of one male and one female from each household could participate. If more than one smoker of the same sex was identified within a household, then only one was randomly selected for a face-to-face interview. ITC-Uruguay used the same protocol to select *manzanas*; however, four attempts were made to enumerate adult members of all households within these *manzanas*. Six of the identified adult smokers were then randomly selected to participate, following the eligibility criteria below. If the quota of six smokers was not reached, the *manzana* that lay on the northeastern edge of the original *manzana* was selected, and the protocol was reinitiated.

In both countries, eligible participants were aged 18 years or older, had smoked at least once in the previous week, and had smoked 100 cigarettes in their lifetimes. Interviewers made up to four visits to interview smokers selected to participate. In Uruguay, 84% (1,524/1,814) of households approached were enumerated, whereas 58% (2,499/4,202) of households approached were enumerated in Mexico. Cooperation rates among eligible, selected participants were 73% in Uruguay and 89% in Mexico.

Measures

Exposure to and support for smoke-free policies. Self-reported existence and strength of smoke-free policies for home, restaurants, and workplaces were assessed with the same question stem (i.e., “Which of the following best describes the rules about smoking in [your home/restaurants where you live/your workplace]?”) and response format (i.e., no rules or restrictions; smoking allowed only in some indoor areas; smoking is not permitted). Workplace smoking policies were asked only for participants who worked in an enclosed area. For multivariate analyses, participants who did not work in enclosed areas were coded as having no workplace smoking policy. A country-level dummy variable was included to reflect the existence in Uruguay (coded as 1) of comprehensive smoke-free legislation that covers restaurants, bars, and enclosed workplaces, versus Mexico (coded as 0), which had weak smoke-free policies that covered only hospitals and government buildings. Support for smoke-free policies was assessed by asking participants the following question separately for workplaces, restaurants, and bars: “For each of the following places, please tell me if you think smoking should be allowed in *all* indoor areas, in *some* indoor areas, or *not allowed* indoors at all.” For multivariate models, responses were dichotomized to reflect support or lack of support for 100% smoke-free indoor areas.

Experiences and beliefs related to SHS. Cues from others regarding the bothersome nature of cigarette smoke were assessed with two questions, one that addressed ever having experienced this situation (i.e., “Has anyone ever told you that the smoke from your cigarette is bothersome?” [yes, no]) and one that assessed more recent experiences (i.e., “In the last month, how often has someone told you that the smoke from your cigarette is bothersome?” [not in the last month; once; a few times; many times]). We combined responses to these questions to create a five-level variable indicating the frequency of encounters with others who tell them that their smoke is bothersome (range = “never been told” to “told many times in the last month”). Smokers’ reactance against social pressures not to smoke in front of others was measured with a single item (i.e., “If someone does not want to breathe the smoke from your cigarette, then they should go somewhere else”) with a five-point response format indicating extent of agreement. Finally, to assess perceived risks associated with SHS, participants were also asked to indicate their extent of agreement with the statement, “Your cigarette smoke is dangerous to those around you.”

Familial and societal norms against smoking. Measures of social norms against smoking referred to one of two social categories: close social network members and the more distal, abstract referent of society. Three items measured perceived norms against smoking among family and other close social network members (i.e., “Your smoking bothers your family” [five-point Likert extent of agreement]; “People who are important to me believe I should not smoke” [five-point Likert extent of agreement]; “In the last month, you have thought about quitting because your family worries about your health” [never, sometimes, frequently]). The internal consistency for this familial antismoking norms scale was low but reasonable ($\alpha = .60$), and responses were averaged after scaling the item with three responses to have the same range (1–5) as responses for the other two scale items. To assess social norms against smoking at a more general, societal level, three questions were used, each with a five-point Likert scale response format indicating extent of agreement (i.e., “[Uruguayan/Mexican] society disapproves of smoking; There are fewer and fewer places where I feel comfortable smoking; People who smoke are more and more marginalized”). The internal consistency for this scale was reasonable ($\alpha = .65$), and responses were averaged to form the societal norms against smoking scale.

Smoking behavior. Self-reported smoking frequency was used to categorize respondents as either daily (1) or nondaily (0) smokers. History of quit behavior reflected at least one attempt to quit in one’s life (1) or no such attempt (0).

Sociodemographic variables. Respondents were asked to report their age, sex, and highest educational level completed. Levels of education across countries were made comparable by combining responses into four levels (i.e., primary school, secondary school, high school, or technical school, more than high school).

Data analyses

All analyses were conducted using Stata version 8.0, adjusting for design effect and sampling weights. Population-level

estimates and *SEs* were generated for each variable under consideration by country. Linear regression models for each country were then used to estimate the bivariate and multivariate adjusted relationships between study variables and continuous dependent variables (i.e., frequency of verbal cues about cigarette smoke as bothersome; reactivity against others' being bothered by their cigarette smoke). When the dichotomous outcomes regarding support for completely smoke-free policies were considered, logistic regression models were estimated for each country.

Results

Sample characteristics

The analytic sample included all participants from ITC-Uruguay ($n = 1,002$) and ITC-Mexico ($n = 1,079$). Table 1 shows the characteristics of the sample population by country. The mean age of 39 years was comparable across countries; however, the Uruguayan sample contained more females (51% vs. 39%), had slightly higher educational attainment, and had a higher percentage both of daily smokers (94% vs. 79%) and of smokers who had tried to quit (65% vs. 49%). Uruguayan smokers also expressed stronger beliefs about the danger posed by SHS and stronger societal norms against smoking, and they reported a higher frequency of others having told them that smoke from their cigarette was bothersome. Almost half (47%) of Mexican smokers indicated that no one had ever told them that their cigarette smoke was bothersome, whereas only a quarter (27%) of Uruguayan smokers indicated as much. Uruguayans also exhibited somewhat lower levels of negative reactivity than Mexicans when presented with a situation in which someone is bothered by their cigarette smoke. Uruguayans reported higher levels of 100% smoke-free policies in their workplaces (82% vs. 60%) and in local restaurants (83% vs. 22%), although the prevalence of 100% smoke-free homes was higher among Mexican smokers (31% vs. 18%). Finally, levels of support for completely smoke-free workplaces, restaurants, and bars were somewhat higher in Uruguay (48%, 41%, and 28%, respectively) than in Mexico (43%, 28%, and 11%, respectively).

Frequency of exposure to verbal cues about SHS

Table 2 shows the results from models when the dependent variable was the frequency of someone telling participants that smoke from their cigarette was bothersome. Bivariate and multivariate adjusted associations for each country suggested that exposure to these verbal cues about SHS was more frequent among smokers who had lower educational attainment, had tried to quit, and whose familial antismoking norms were stronger. Younger Uruguayan smokers reported more frequent exposure to these cues than older Uruguayan smokers, whereas age was not associated with this outcome among Mexican smokers. Perceived societal norms against smoking were independently associated with a greater frequency of being told that smoking is bothersome in Mexico ($B = 0.274$, $p < .01$), but not in Uruguay ($B = -0.023$).

Reactance to concerns about SHS

Psychological reactance to concerns that other people express about SHS was regressed on other variables in bivariate and

Table 1. Study participants' sociodemographic characteristics and psychosocial factors related to SHS and smoke-free policy

Variable	Uruguay	Mexico	<i>p</i> value
Mean age, years	38.4	39.0	.33
Male (%)	49	61	<.0001
Education			
Primary (%)	21	28	.003
Secondary (%)	32	27	
High school (%)	32	30	
University (%)	15	14	
Daily smoker (%)	94	79	<.0001
Ever tried to quit (yes, %)	65	49	<.0001
SHS is dangerous (five-point Likert)	4.15	4.09	.03
Reactance to concerns about SHS (five-point Likert) ^a	1.65	1.87	.001
Frequency of verbal cues about SHS			
Never (%)	27	47	<.0001
Not in last month (%)	19	10	
Once in last month (%)	6	6	
A few times in last month (%)	26	27	
Many times in last month (%)	22	10	
Antismoking norms			
Familial	3.59	3.61	<i>ns</i>
Societal	3.34	3.00	<.0001
Smoke-free policy environment			
Home			
None (%)	51	39	
Partial (%)	31	30	
100% (%)	18	31	
Local restaurants			
None (%)	8	17	<.0001
Partial (%)	10	61	
100% (%)	83	22	
Work ^b			
None (%)	8	9	<.0001
Partial (%)	10	31	
100% (%)	82	60	
Work ^c			
None (%)	60	67	<.0001
Partial (%)	4	11	
100% (%)	36	22	
Support for 100% smoke-free policy			
Workplace	48	43	.022
Restaurant	41	28	<.0001
Bars	28	11	<.0001

Note. SHS = secondhand smoke; *ns*, nonsignificant.

^aHigher score reflects greater reactance against social pressures to not smoke.

^bIncludes only smokers who work in enclosed areas.

^cSmokers who do not work inside coded as "none."

multivariate models (Table 3). In bivariate and multivariate models for both countries, higher levels of reactance were associated with lower educational attainment and stronger societal norms against smoking. Among Uruguayan but not Mexican

Table 2. Bivariate and multivariate adjusted associations between frequency of exposure to SHS verbal cues^a and psychosocial, behavioral, environmental, and sociodemographic variables

Independent variable	Uruguay		Mexico	
	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)
Age	−0.009 (0.004)*	−0.015 (0.004)***	−0.006 (0.004)	−0.008 (0.004)
Male vs. female	0.083 (0.123)	0.029 (0.105)	−0.038 (0.141)	0.022 (0.146)
Education	−0.215 (0.069)**	−0.213 (0.069)**	−0.006 (0.073)	0.001 (0.070)
Daily vs. nondaily smoker	0.240 (0.287)	0.093 (0.289)	0.178 (0.201)	0.122 (0.173)
Ever tried to quit vs. never	0.327 (0.107)**	0.273 (0.111)*	0.432 (0.140)**	0.383 (0.136)**
Antismoking norms				
Familial	0.447 (0.080)****	0.415 (0.081)****	0.251 (0.088)**	0.198 (0.087)*
Societal	0.086 (0.081)	−0.023 (0.085)	0.262 (0.088)**	0.274 (0.093)**
Smoke-free policy				
Home	0.107 (0.102)	0.017 (0.093)	−0.089 (0.091)	−0.074 (0.096)
Restaurants	−0.082 (0.133)	−0.067 (0.124)	0.027 (0.108)	−0.017 (0.121)
Work	−0.225 (0.070)**	−0.105 (0.072)	−0.042 (0.088)	−0.064 (0.082)

Note. ^aFrequency of others telling participants that the smoke from their cigarettes is bothersome.

p* < .05; *p* < .01; ****p* < .001; *****p* < .0001.

smokers, less frequent cues about SHS as bothersome and stronger familial antismoking norms were associated with lower reactance. Only among Mexican smokers was greater perceived danger of SHS associated with lower reactance. Finally, a statistically nonsignificant bivariate association between smoke-free workplace policies and reactance became marginally significant in multivariate models for Mexico.

Support for 100% smoke-free policies

Tables 4 and 5 show results from models from Uruguay and Mexico, respectively, when the dependent variable was support for completely smoke-free workplaces, restaurants, and bars. For restaurants and workplaces, the only sociodemographic or smoking behavior variable associated with support for

smoke-free policy was Mexican males' lesser support than females for workplace bans. Support for smoke-free bars was associated with older age and female sex in Uruguay, whereas it was associated with higher education among Mexicans. The strength of one's belief in SHS as dangerous to others was independently associated with support for smoke-free policies only when examining restaurant policies among Uruguayans. Also found among Uruguayan smokers, but not Mexican smokers, was the positive, independent association between familial norms against smoking and support for smoke-free policies in each venue. Societal norms against smoking and exposure to smoke-free policies in local restaurants and in participants' workplaces were not associated with support for any smoke-free policy in either country. The strength of voluntary home policies was independently associated with support for smoke-free policies

Table 3. Bivariate and multivariate adjusted associations between strength of reactance^a against social pressures not to smoke and psychosocial, behavioral, environmental, and sociodemographic variables

Independent variable	Uruguay		Mexico	
	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)
Age	−0.005 (0.004)	−0.005 (0.004)	0.003 (0.003)	0.002 (0.003)
Male vs. female	0.031 (0.092)	0.018 (0.084)	0.000 (0.110)	0.077 (0.114)
Education	−0.108 (0.049)*	−0.105 (0.050)*	−0.135 (0.046)**	−0.108 (0.047)*
Daily vs. nondaily smoker	0.041 (0.184)	−0.049 (0.185)	−0.169 (0.122)	−0.123 (0.130)
Ever tried to quit vs. never	−0.157 (0.088)	−0.127 (0.086)	0.111 (0.117)	0.091 (0.105)
SHS danger	−0.119 (0.083)	−0.110 (0.080)	−0.194 (0.059)**	−0.214 (0.064)**
Frequency of SHS verbal cues	0.061 (0.036)	0.077 (0.035)*	−0.041 (0.036)	−0.043 (0.035)
Antismoking norms				
Familial	−0.132 (0.065)*	−0.175 (0.066)**	−0.125 (0.063)	−0.092 (0.062)
Societal	0.143 (0.065)*	0.204 (0.062)***	0.305 (0.081)***	0.354 (0.072)****
Smoke-free policy				
Home	−0.118 (0.077)	−0.085 (0.076)	0.015 (0.068)	0.051 (0.068)
Restaurants	−0.158 (0.087)	−0.111 (0.090)	0.020 (0.079)	−0.036 (0.078)
Work	−0.045 (0.051)	−0.014 (0.049)	0.088 (0.052)	0.114 (0.049)*

Note. SHS = secondhand smoke.

^aHigher score reflects greater reactance.

p* < .05; *p* < .01; ****p* < .001; *****p* < .0001.

Table 4. Bivariate and multivariate adjusted associations with support for completely smoke-free workplaces, restaurants, and bars in Uruguay

Independent variable	Workplace		Restaurant		Bars	
	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)
Age	0.003 (0.007)	0.004 (0.007)	−0.003 (0.007)	−0.004 (0.007)	0.017 (0.007)*	0.015 (0.007)*
Male vs. female	−0.083 (0.137)	−0.070 (0.135)	−0.188 (0.132)	−0.240 (0.139)	−0.351 (0.147)*	−0.424 (0.153)**
Education	0.013 (0.090)	0.012 (0.094)	−0.033 (0.095)	−0.099 (0.094)	−0.150 (0.097)	−0.160 (0.098)
Daily vs. nondaily smoker	−0.208 (0.334)	−0.132 (0.349)	−0.150 (0.360)	−0.050 (0.381)	−0.135 (0.358)	−0.028 (0.400)
Ever tried to quit vs. never	0.061 (0.190)	−0.177 (0.203)	0.240 (0.181)	0.072 (0.184)	0.226 (0.206)	0.020 (0.217)
SHS danger	0.260 (0.123)*	0.135 (0.128)	0.382 (0.116)**	0.240 (0.114)*	0.276 (0.164)	0.125 (0.152)
Antismoking norms						
Familial	0.644 (0.120)****	0.677 (0.131)****	0.571 (0.120)****	0.518 (0.125)****	0.642 (0.128)****	0.637 (0.135)****
Societal	−0.052 (0.154)	−0.283 (0.177)	0.080 (0.126)	−0.073 (0.131)	0.117 (0.145)	−0.057 (0.142)
Smoke-free policy						
Home	0.412 (0.114)***	0.383 (0.118)**	0.425 (0.097)****	0.374 (0.105)***	0.237 (0.113)*	0.202 (0.127)
Restaurant	0.225 (0.148)	0.162 (0.148)	0.324 (0.145)*	0.277 (0.146)	0.386 (0.168)*	0.335 (0.172)
Work	0.074 (0.089)	0.126 (0.088)	0.015 (0.101)	0.089 (0.111)	0.135 (0.135)	0.209 (0.132)

Note. SHS = secondhand smoke.

* $p < .05$; ** $p < .01$; *** $p < .001$; **** $p < .0001$.

across all three venues examined in Uruguay and in workplaces and restaurants, but not bars, in Mexico.

Discussion

Results from the present study generally support hypotheses regarding the association between stronger smoke-free policies and lower social acceptability of tobacco smoke exposure. Compared with Mexican smokers, much higher percentages of Uruguayan smokers reported smoke-free policies in their enclosed workplaces (82% vs. 60%) and in restaurants near their

homes (83% vs. 22%), verifying Uruguay's comprehensive policy. Uruguayan smokers also reported more cues from others that SHS is bothersome, lower reactance against others' concerns about SHS, and stronger support for 100% smoke-free policies in enclosed workplaces, restaurants, and bars. In bivariate analyses, Uruguayan smokers reported overall stronger societal norms against smoking, compared with Mexican smokers. However, we found no cross-country difference in the strength of familial antismoking norms, and Mexicans were more likely than Uruguayans to report that their households were completely smoke free (31% vs. 18%, respectively). Without data on smoke-free homes prior to the implementation of the Uruguayan

Table 5. Bivariate and multivariate adjusted associations with support for completely smoke-free workplaces, restaurants, and bars in Mexico

Independent variable	Workplace		Restaurant		Bars	
	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)	Bivariate <i>B</i> (<i>SE</i>)	Multivariate <i>B</i> (<i>SE</i>)
Age	0.010 (0.007)	0.014 (0.008)	0.006 (0.007)	0.002 (0.008)	0.016 (0.009)	0.013 (0.011)
Male vs. female	−0.494 (0.167)**	−0.544 (0.182)**	−0.080 (0.178)	−0.168 (0.184)	0.110 (0.200)	−0.171 (0.216)
Education	0.157 (0.096)	0.147 (0.099)	0.087 (0.102)	0.041 (0.102)	0.414 (0.140)**	0.445 (0.147)**
Daily vs. nondaily smoker	−0.614 (0.238)*	−0.554 (0.219)*	−0.591 (0.312)	−0.514 (0.311)	−0.509 (0.424)	−0.307 (0.413)
Ever tried to quit vs. never	−0.065 (0.223)	0.114 (0.206)	−0.305 (0.224)	0.003 (0.198)	−0.683 (0.271)*	−0.25 (0.292)
SHS danger	−0.026 (0.123)	−0.025 (0.125)	−0.049 (0.134)	0.108 (0.131)	−0.452 (0.155)**	−0.258 (0.145)
Antismoking norms						
Familial	0.154 (0.116)	0.118 (0.128)	0.013 (0.133)	−0.133 (0.149)	−0.189 (0.170)	−0.304 (0.189)
Societal	−0.037 (0.125)	−0.048 (0.125)	0.224 (0.126)	0.236 (0.131)	0.039 (0.151)	0.161 (0.153)
Smoke-free policy						
Home	0.238 (0.159)	0.306 (0.143)*	0.448 (0.148)**	0.492 (0.133)***	0.638 (0.216)**	0.828 (0.215)***
Restaurant	−0.192 (0.142)	−0.293 (0.159)	0.262 (0.166)	0.189 (0.177)	−0.035 (0.231)	−0.221 (0.272)
Work	−0.033 (0.090)	−0.038 (0.085)	−0.067 (0.121)	−0.161 (0.120)	−0.084 (0.183)	−0.217 (0.183)

Note. SHS = secondhand smoke.

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

policy, we cannot determine whether this policy influenced voluntary home policies. However, data from other countries indicate that smoke-free policies in public places either promote smoke-free home policies (Borland, Yong, Cummings, et al., 2006) or do not affect them (Biener et al., 2007; Fong, Hyland et al., 2006).

In both countries, study results indicated no association between exposure to venue-specific smoke-free policies and receiving verbal cues against SHS or reactance against such cues. Hence, the results provide some support for the suggestion that policies that displace smoking behavior from areas that smokers and nonsmokers share may either reduce or not influence the frequency of verbal cues that could prompt smokers to quit (Gottlieb et al., 1990). Furthermore, the strength of venue-specific smoke-free policies was generally not associated with smokers' reactance against others who tell them about the bothersome nature of their cigarette smoke, suggesting that stronger policies did not cause any backlash among smokers. The exception to this was the marginal, independent association between exposure to smoke-free workplace policies and greater reactance among Mexican smokers. The relative lack of smoke-free policies in other venues may make workplace policies seem less normative than in contexts, such as Uruguay, where comprehensive smoke-free policies apply.

Our results suggest that perceived familial norms against smoking were consistently associated with all indicators of the social unacceptability of smoking in Uruguay. In Mexico, however, antismoking familial norms were associated only with receiving more verbal cues about SHS. At first glance, these results may seem counterintuitive given the strong familial orientation in Mexico and the presumably weaker familial orientation in Uruguay, whose cultural inheritance is closer to the more individually oriented traditions of Europe. However, the greater salience of familial norms in Uruguay than in Mexico may reflect the increased importance of variability in familial norms once comprehensive policies reduce variability in exposures to smoke-free environments beyond the family. In Uruguay, stronger familial antismoking norms also were associated with lower reactance against cues from others about SHS, suggesting that Uruguayan smokers' reactance against others decreases as antismoking norms are integrated into the family system. These hypotheses should be tested through longitudinal analyses that assess psychosocial characteristics of smokers before and after comprehensive smoke-free policy implementation.

Finally, perceived societal norms against smoking were not associated with support for smoke-free policies in any venue, in either country. Only in Mexico were societal norms positively associated with greater frequency of receiving verbal cues from others about SHS. In both Mexico and Uruguay, stronger perceived societal antismoking norms were associated with greater reactance against SHS cues, suggesting that smokers who perceive the more distal, abstract referent of society as stigmatizing their behavior may respond negatively. This reactance does not appear directly due to smoke-free policies, however, given the aforementioned results that generally indicate a lack of association between exposure to these policies and reactance.

The conclusions reported here are not definitive. Multiple tests of significance were conducted, increasing the likelihood of Type 1 error. Furthermore, the cross-sectional nature of the data

precludes causal inference for many of the associations studied. It could be hypothesized, for example, that generally lower acceptability of smoking in Uruguay accounts for why comprehensive smoke-free policies were implemented there, but not in Mexico. Although this is a plausible account, Uruguayan smoke-free policy did not result from a swell of popular support but from the relatively unique circumstance of an oncologist's serving as president and his ability to declare by decree a comprehensive policy. Hence, the social acceptability of smoking may not have been that different across the two countries before policy implementation, as is indicated by the comparable strength of familial antismoking norms and, perhaps, the higher prevalence of smoke-free homes in Mexico. Indeed, our analyses controlled for smokers' perceptions of familial and societal norms against smoking, while focusing on other behavioral and attitudinal indicators of the acceptability of smoking in front of others and across different venues. Nevertheless, longitudinal data that encompass the period before policy implementation would be needed to strengthen conclusions about any changes due to this policy. To help with this assessment, the Mexican cohort will be followed up after new smoke-free legislation comes into force.

The data used for this study may not generalize to the Mexican and Uruguayan populations. Those who did not participate in the studies may be different in important ways from those who participated; however, data were not collected from nonrespondents to assess this possibility. However, in the case of Uruguay, data were collected in the city of Montevideo, where the majority of the country's inhabitants reside. The Mexican sampling frame had lower coverage of the Mexican population, which is larger and more diverse and is spread over a much greater area than in Uruguay. The Mexican sample was taken from four of the largest urban centers in Mexico, but no other large cities and no rural areas were sampled. Nationally representative estimates for some of the variables analyzed here will come from the Mexican administration of the Global Adult Tobacco Survey, scheduled for 2008.

Despite the limitations of the present study, the results are generally consistent with the pattern of lower social acceptability of tobacco smoke and lower resistance against smoke-free policies once comprehensive policies are in place. Not surprisingly, the evidence for these associations appears weaker for the impact of more piecemeal, venue-specific smoke-free policies on the social acceptability of smoking, as was the case for Mexico. Moreover, successful smoke-free policies such as Uruguay's have likely benefited from mass-media campaigns that provide smokers and nonsmokers alike with arguments in favor of smoke-free policies and that do not stigmatize smokers.

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Declaration of Interests

None declared.

References

- Abundis, F. (2008). La Ley General de Control del Tabaco y la opinión pública [The general law of tobacco control and public opinion]. *Salud Pública de México*, 50(Suppl. 3), S366–S371.
- Albers, A. B., Siegel, M., Cheng, D. M., Biener, L., & Rigotti, N. A. (2007). Effect of smoking regulations in local restaurants on smokers' anti-smoking attitudes and quitting behaviors. *Tobacco Control*, 16, 101–106.
- Baezconde-Garbanati, L., Beebe, L., & Perez-Stable, E. J. (2007). Building capacity to address tobacco-related disparities among in American Indian and Hispanic/Latino communities: Conceptual and systemic considerations. *Addiction*, 102(Suppl. 2), 112–122.
- Baezconde-Garbanati, L., Portugal, C., Barahona, R., & Carasco, C. (2007). *Reaching Hispanic/Latino communities—Addressing secondhand smoke & cessation*. Sacramento, CA: Hispanic/Latino Tobacco Education Partnership, Tobacco Control Section, Cancer Control Branch, California Department of Health.
- Biener, L., Abrams, D. B., Follick, M. J., & Dean, L. (1989). A comparative evaluation of a restrictive smoking policy in a general hospital. *American Journal of Public Health*, 79, 192–195.
- Biener, L., Garrett, C., Skeer, M., Siegel, M., & Connolly, G. (2007). The effects on smokers of Boston's smoke-free bar ordinance: A longitudinal analysis of changes in compliance, patronage, policy support and smoking at home. *Journal of Public Health Management and Practice*, 13, 630–636.
- Biener, L., Glanz, K., McLerran, D., Sorensen, G., Thompson, B., Baesn-Engquist, K., et al. (1999). Impact of the working well trial on the worksite smoking and nutrition environment. *Health Education and Behavior*, 26, 478–494.
- Bird, Y., Moraros, J., Olsen, L. K., Forster-Cox, S., Staines-Orozco, H., & Buckingham, R. W. (2007). Smoking practices, risk perception of smoking, and environmental tobacco smoke exposure among 6th-grade students in Ciudad Juárez, Mexico. *Nicotine & Tobacco Research*, 9, 195–203.
- Borland, R., Yong, H.-H., Cummings, K. M., Hyland, A., Anderson, S., & Fong, G. T. (2006). Determinants and consequences of smoke-free homes: Findings from the International Tobacco Control Four Country Survey. *Tobacco Control*, 15(Suppl. 3), iii42–iii50.
- Borland, R., Yong, H.-H., Siapush, M., Hyland, A., Campbell, S., Hastings, G., et al. (2006). Support for and reported compliance with smoke-free restaurants and bars in four countries: Findings from the International Tobacco Control Four Country Survey. *Tobacco Control*, 15(Suppl. 3), iii34–iii41.
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. New York: Academic.
- Brownson, R. C., Hopkins, D. P., & Wakefield, M. (2002). Effects of smoking restrictions in the workplace. *Annual Review of Public Health*, 23, 333–348.
- Fichtenberg, C. M., & Glantz, S. A. (2002). Effect of smoke-free policies on smoking behavior: A systematic review. *British Medical Journal*, 325, 188.
- Fong, G. T., Cummings, K. M., Borland, R., Hastings, G., Hyland, A., Giovino, G. A., et al. (2006). The conceptual framework of the International Tobacco Control Policy Evaluation Project. *Tobacco Control*, 15(Suppl. 3), iii3–iii11.
- Fong, G. T., Hyland, A., Borland, R., Hammond, D., Hastings, G., McNeil, A. D., et al. (2006). Reductions in tobacco smoke pollution and increases in support for smoke-free public places following the implementation of comprehensive smoke-free workplace legislation in the Republic of Ireland: Findings from the ITC Ireland/UK survey. *Tobacco Control*, 15(Suppl. 3), iii51–iii58.
- Gorini, G., Chellini, E., & Galeone, D. (2007). What happened in Italy? A brief summary of studies conducted in Italy to evaluate the impact of the smoking ban. *Annals of Oncology*, 18, 1620–1622.
- Gottlieb, N. H., Eriksen, M. P., Lovato, C. Y., Weinstein, R. P., & Green, L. W. (1990). Impact of a restrictive work site smoking policy on smoking behavior, attitudes, and norms. *Journal of Occupational Medicine*, 32, 16–23.
- Hamilton, W. L., Biener, L., & Brennan, R. T. (2008). Do local tobacco regulations influence perceived smoking norms? Evidence from adult and youth surveys in Massachusetts. *Health Education Research*, 23, 709–722.
- Hammond, D., Fong, G. T., Zanna, M. P., Thrasher, J. F., & Borland, R. (2006). Tobacco denormalization, anti-industry beliefs, and cessation behavior among smokers from four countries. *American Journal of Preventive Medicine*, 31, 225–232.
- Jacobson, P. D., & Zapawa, L. M. (2001). Clean indoor air restrictions. In R. L. Rabin and S. D. Sugarman (Eds.), *Regulating tobacco* (pp. 207–244). New York: Oxford University Press.
- MacKinnon, D. P., Taborga, M. P., & Morgan-Lopez, A. A. (2002). Mediation designs for tobacco prevention research. *Drug and Alcohol Dependence*, 68, S69–S83.
- Mathers, C., & Loncar, D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLoS*, 3, e442.
- Sebrié, E. M., Schoj, V., & Glantz, S. A. (2008). Smoke free environments in Latin America: On the road to real change? *Prevention and Control*, 3, 21–35.
- Thrasher, J. F., Chaloupka, F., Hammond, D., Fong, G. T., Borland, R., Hastings, G., et al. (2006). Evaluación de las políticas contra el tabaquismo en países latinoamericanos en la era del Convenio Marco para el Control del Tabaco [Evaluation of tobacco control policies in Latin American

countries during the era of the Framework Convention on Tobacco Control]. *Salud Pública de México*, 48(Suppl. 1), S155–S166.

Thrasher, J. F., Reynales-Shigematsu, L., Baezconde-Garbanati, L., Villalobos, V., Téllez-Girón, P., Arillo-Santillán, E., et al. (2008). Promoting the effective translation of the Framework Convention on Tobacco Control: A case study of challenges and opportunities for strategic communications in Mexico. *Evaluation & the Health Professions*, 31, 145–166.

Valdés-Salgado, R., Thrasher, J. F., Sánchez-Zamorano, L. M., Lazcano-Ponce, E. C., Reynales-Shigematsu, L. M., Meneses-

Gonzalez, F., et al. (2006). Los retos del Convenio Marco para el Control del Tabaco en México: Un diagnostico a partir de la Encuesta sobre Tabaquismo en Jóvenes [Challenges for the framework convention on tobacco control in Mexico: A diagnosis using the Global Youth Tobacco Survey]. *Salud Pública de México*, 48(Suppl. 1), S5–S16.

Wasserman, J., Manning, W. G., Newhouse, J. P., & Winkler, J. D. (1991). The effects of excise taxes and regulations on cigarette smoking. *Journal of Health Economics*, 1991, 43–64.

World Health Organization. (2003). *Framework convention on tobacco control*. Geneva, Switzerland: World Health Organization, Tobacco Free Initiative.