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Original Investigation

Students' perception of community disapproval, perceived enforcement of school antismoking policies, personal beliefs, and their cigarette smoking behaviors: Results from a structural equation modeling analysis

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Abstract

Introduction: School tobacco use policies are often considered to be part of a comprehensive approach to preventing or reducing adolescent cigarette smoking. However, little is known about the relationships between such policies and adolescents' smoking behaviors or the mechanisms by which any such influence may occur. The present study tested a conceptual model that specifies possible direct and indirect relationships among community norms, school antismoking policies, adolescents' personal smoking beliefs, and cigarette smoking behaviors.

Methods: This study used data from 17,256 middle and high school students who participated in the 2006 Oregon Health Teens Survey.

Results: Structural equation modeling indicated that perceived enforcement of school policy was directly and positively related to perceived community norms. In addition, adolescents' personal beliefs appeared to mediate the relationship between perceived enforcement of school antismoking policies and past-30-day cigarette smoking. School policies, in turn, partially mediated the relationship between community norms and smoking beliefs.

Discussion: The results of this study provide a better understanding of how community norms and school antismoking policies may affect adolescents' cigarette smoking.

Introduction

The adverse health effects of cigarette smoking are well documented (Bjartveit & Tverdal, 2005; Mucha, Stephenson, Morandi, & Dirani, 2006; Peto, Lopez, Boreham, Thun, & Heath, 1994). During childhood and adolescence, cigarette smoking produces significant health problems, including increased cough, increased number and severity of respiratory illnesses, decreased fitness, and potential retardation in the rate of lung growth (Arday, Giovino, & Schulman, 1995). Early smoking initiation also is associated with increased risk for the development of tobacco dependence later in life (U.S. Department of Health and Human Services, 1994). Since most adolescents spend a large portion of their time in school, the school environment is an important factor in controlling and preventing adolescent cigarette smoking (Evans-Whipp et al., 2004).

Little is known, however, about the relationship between school antismoking policies and adolescents' smoking behaviors or about the mechanisms by which any influence of school policy occurs (Evans-Whipp et al., 2004; Evans-Whipp, Bond, Toumbourou, & Catalano, 2007; Lantz et al., 2000; Moore, Roberts, & Tudor-Smith, 2001). To address these issues, the present study conducted a preliminary test of a conceptual model that specifies possible direct and mediated relationships among community norms, school antismoking policies, adolescents' personal smoking beliefs, and smoking behavior (Figure 1). This model is grounded largely in social learning theory (Bandura, 1986) and also is influenced by Eccles and Roeser's ecological view of schools and their impact on development during adolescence (Eccles, 2004).

The conceptual framework proposes that schools' influence on adolescents' behaviors is a dynamic multilevel process that involves the students embedded within schools, the school environment, and the larger communities in which schools are located. A similar view was presented by Eccles and Roeser (see Eccles, 2004) to explain school influences on youth development.

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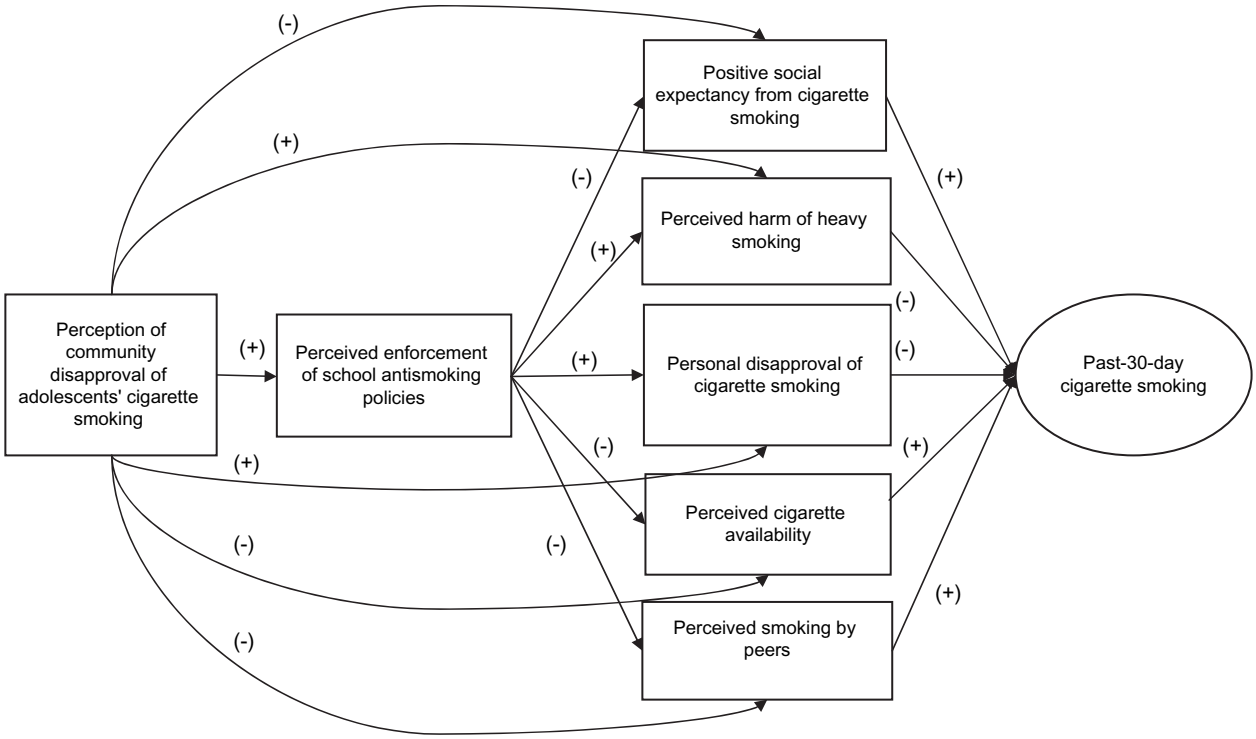

Figure 1. Conceptual model of community norms, school antismoking policies, adolescents' personal beliefs, and their smoking behavior.

Consistent with a social learning approach, we hypothesized that smoking behaviors are largely the result of cognitive processes through which people anticipate the consequences associated with their actions and act accordingly (Bandura, 1986). From this perspective, the most proximal determinants of an adolescent's smoking are his or her personal beliefs about this behavior, including perceived social and health risks or benefits of smoking, perceived availability of tobacco (i.e., the individual's perception of how easy it is to obtain cigarettes), and perceived smoking by friends. These beliefs, in turn, are hypothesized to mediate the effects of school antismoking policies as well as community norms and other more distal social influences. Community norms regarding adolescents' cigarette smoking are hypothesized to directly affect school policies as well as beliefs about smoking.

One of the assumptions of the model is that schools are embedded within a larger social system. With regard to drug policies, most states and school districts provide individual schools with health policy guidelines or programs. Some of them directly mandate school-level health policies and programs, whereas others provide only general guidelines and leave specific elements of the policies up to schools (Jones, Fisher, Greene, Hertz, & Pritzl, 2007). Therefore, a reasonable assumption is that school antismoking policies and enforcement efforts are determined in part by broader community norms about youth cigarette smoking. An international study in Victoria, Australia, and Washington state in the United States provides support for the importance of the broader social context for school policies and youth smoking (Evans-Whipp et al., 2007). School administrations from Washington, a zero-tolerance context, were more likely to use punitive measures to enforce school drug policies than were administrations from Victoria, a context that focuses more on harm minimization. Similarly, more students from Washington than from Victoria reported that punitive measures were used for all drug-type violations. For the present study, we hypothesized that schools within communities that disapprove more highly of adolescents' cigarette smoking will be more likely to implement and enforce antismoking policies than will schools within communities that are more tolerant of youth cigarette smoking.

At the level of individual schools, studies about the relationships between school antismoking policies and adolescents' smoking behaviors provide mixed results. Some studies suggest that the prevalence of smoking is lower when school policies against tobacco use are in place (Moore et al., 2001; Pentz et al., 1989), whereas others found only inconsistent or minimal effects (Clarke, White, Hill, & Borland, 1994; Darling, Reeder, Williams, & McGee, 2006; Hamilton, Cross, Lower, Resnicow, & Williams, 2003; Rosendahl, Galanti, Gilljam, Bremberg, & Ahlbom, 2002). However, studies in this area clearly suggest that consistent enforcement is related to antismoking policy effectiveness (Griesbach, Inchley, & Currie, 2002; Lovato, Sabiston, Hadd, Nykifouruk, & Campbell, 2007; Moore et al., 2001; Wakefield et al., 2000). Specifically, these studies indicated that school antismoking policies appear to be related to lower levels of smoking only when these policies are strongly enforced or perceived by students to be strongly enforced.

Enforcement of school antismoking policies, in turn, may affect adolescents' smoking behaviors indirectly through its effects on adolescents' beliefs about the availability of cigarettes, the potential health and social risks of cigarette smoking, positive social outcomes of cigarette smoking, smoking by peers, and the acceptability (approval–disapproval) of cigarette smoking

by peers. Numerous studies have demonstrated that such beliefs are predictive of adolescents' cigarette smoking behavior (Andrews & Duncan, 1998; Sloan, Smith, & Taylor, 2003).

Methods

Study sample and survey procedures

This study is based on secondary analyses of data from 17,256 middle and high school students who participated in the 2006 Oregon Health Teens (OHT) Survey and provided complete data for all study variables. The OHT Survey was implemented in a sample of 255 schools (primarily among 8th and 11th graders) throughout the state of Oregon that (a) were part of either a statewide random OHT sample or a Centers for Disease Control and Prevention Youth Risk Behavior Survey sample or (b) wished to participate voluntarily. The OHT Survey uses a passive parental consent procedure. Parents and guardians are notified in advance of the survey, provided with a description of it, and given the opportunity to decline participation for their child. If they do not decline, their consent for their child's participation is assumed. The survey is voluntary, and students can refuse to participate at the time of the administration. Surveys were administered by teachers or other school staff who were given a detailed protocol by an OHT Survey contractor. The surveys were given to students in their classrooms and took one class period to complete. Survey forms as well as notification letters were available in English and Spanish. OHT Survey data were collected anonymously, and institutional review board approval was obtained prior to study implementation. The overall OHT Survey response rate was 81.2%. Sample characteristics are provided in Table 1.

Table 1. Sample characteristics ($N = 17,256$)

Variable	Results
Gender (%)	
Male	46.0
Female	54.0
Race/ethnicity (%)	
White	80.7
Non-White	19.3
Age, years (%)	
12–14	49.7
15–16	19.6
17–18	30.6
Cigarette smoking–related behaviors	
Initiation of cigarette smoking before age 12 (%)	7.9
Frequency of cigarette smoking, past 30 days	1.45 (5.52)
Frequency of cigarette smoking on school property, past 30 days	0.17 (1.62)
Number of cigarettes smoked, past 30 days	0.38 (1.59)
Personal beliefs	
Perceived social expectancies from smoking cigarettes	1.76 (0.71)
Perceived harm of heavy smoking	3.46 (0.80)
Personal disapproval of cigarette smoking	3.34 (0.88)
Perceived tobacco availability	2.86 (1.24)
Perceived smoking by peers	1.72 (1.23)
Perceived enforcement of school antismoking policy	3.52 (0.78)
Perception of community disapproval of adolescents' cigarette smoking	3.33 (0.81)

Note. Results are means with *SD*s, unless noted otherwise.

Measures

The OHT Survey addresses a wide range of health and behavioral issues. Survey items are based on other survey instruments, including the Youth Risk Behavior Survey (Centers for Disease Control and Prevention, 2007) and the Washington State Healthy Youth Survey (Washington State Department of Health, 2006).

Cigarette smoking. Responses to three questions presented on a series of 7-point scales were used to measure adolescents' cigarette smoking in the past 30 days. Participants were asked the number of days they smoked cigarettes in the past 30 days and of the number of days they smoked cigarettes on school property (response options were "0," "1–2," "3–5," "6–9," "10–19," "20–29," and "all 30" days). They also were asked about the number of cigarettes they smoked each day they smoked (response options: "I did not smoke cigarettes during the past 30 days," "less than 1" and "1" cigarette/day and "2–5," "6–10," "11–20," and "more than 20" cigarettes/day). These items were moderately to strongly correlated (r values = .40–.76) and were used as indicators for a latent variable representing past-30-day cigarette smoking.

Age at initiation of cigarette smoking. Each student was asked how old he or she was the first time he or she smoked a whole cigarette (response options: "I have never smoked a whole cigarette," "8 years old or younger," "9," "10," "11," 12," "13," "14," "15," and "16" years old, and "17 years old or older"). This variable was recoded as single dichotomous indicator of whether a respondent had initiated cigarette smoking before the age of 12 and was included as a control variable.

Students' personal smoking beliefs. Personal beliefs included positive social smoking expectancies, perceived harm of heavy smoking, personal disapproval, perceived tobacco availability, and perceived smoking by peers. To measure positive social expectancies, students were asked, "Do you think young people who smoke cigarettes have more friends?" This item was presented on a 4-point response scale ranging from "definitely not" to "definitely yes." Perceived harm of heavy smoking was measured by asking the students, "How much do you think people risk harming themselves (physically or in other ways) if they smoke one or more packs of cigarettes per day?" The 4-point response scale ranged from "no risk" to "great risk." Personal disapproval was assessed by the question, "How wrong do you think it is for someone your age to smoke cigarettes?" The 4-point response scale ranged from "not wrong at all" to "very wrong." Perceived tobacco availability was measured by asking the adolescents, "If you wanted to get some tobacco (for example, cigarettes or chewing tobacco), how easy would it be for you to get some?" The 4-point response scale ranged from "very hard" to "very easy." Finally, to measure perception of smoking by peers, students were asked how many of their four best friends smoked cigarettes during the 12 months preceding the survey, with a 5-point response scale ranging from "none" to "four." The correlations between the personal belief items were weak to moderate in strength ($r = -.04$ to $-.48$; see Table 2).

Table 2. Correlation matrix among study variables ($N = 17,256$)

	1	2	3	4	5	6	7	8	9	10
Past 30 days cigarette use[1]		.42*	.76*	.16*	−.11*	−.41*	.21*	.47*	−.01	−.18*
Past 30 days cigarette use on school property[2]			.40*	.10*	−.06*	−.18*	.09*	.20*	−.05*	−.09*
Past 30 days, number of cigarettes used[3]				.16*	−.11*	−.36*	.19*	.40*	−.02*	−.17*
Positive social expectancies[4]					−.16*	−.27*	.17*	.22*	−.07*	−.16*
Perceived harm of heavy smoking[5]						.24*	−.04*	−.08*	.08*	.11*
Personal disapproval[6]							−.37*	−.48*	.09*	.36*
Perceived availability[7]								.37*	−.14*	−.23*
Perceived smoking by peers[8]									−.04*	−.22*
Enforcement of school policy[9]										.10*
community disapproval[10]										

Note. $*p < .01$.

All relationships among personal belief items were in the expected direction. For example, high perceived tobacco availability was positively correlated with positive social expectancies but negatively correlated with perceived harm of heavy smoking and personal disapproval of youth smoking. Weak negative relationships were found between perceived harm of heavy smoking and perceived tobacco availability ($r = -.04$) and perceived smoking by peers ($r = -.08$). In the structural equation analysis, each personal belief item was included as a separate observed variable.

Enforcement of school tobacco policy. Enforcement of school tobacco policy was measured by the question, "Is there a rule against tobacco in your school?" The four possible responses were "there is no rule," "there is a rule, but it isn't enforced," "there is a rule and it is sometimes enforced," and "there is a rule and it is strictly enforced."

Community disapproval of adolescents' cigarette smoking. Community disapproval of adolescents' cigarette smoking was measured by the question, "How wrong would most adults in your neighborhood, or the area around where you live, think it is for someone your age to smoke cigarettes?" The 4-point response scale ranged from "not wrong at all" to "very wrong."

Demographics. Students reported their gender, race/ethnicity, and age. Race/ethnicity was dichotomized (White vs. non-White) because the vast majority of respondents were White (80.7%).

Data analyses

Latent variable structural equation modeling analyses were used to provide a preliminary test of our conceptual model and to investigate the relationships among community disapproval of adolescents' cigarette smoking, perceived enforcement of school antismoking policies, adolescents' personal beliefs, and adolescents' past-30-day cigarette smoking, taking into account individual characteristics (i.e., gender, age, ethnicity, and age at onset of cigarette smoking). Cigarette smoking was a latent variable with three indicators. The other variables included in the model were single-observed variables. Initially, a fully mediated model was solved (Figure 1). That is, we assumed that the relationships between community norms and smoking behavior were mediated through school policy and personal smoking beliefs. Similarly, we assumed that the relationship between perceived enforcement and smoking was mediated through smoking beliefs. All structural paths depicted in this conceptual model were included at the first stage of the analyses, as were correlations among disturbance terms for the belief variables at the same level in the model. Community norms and all the demographic variables were allowed to covary freely with one another. A specification search using Lagrange multiplier (LM) tests was then undertaken to ascertain whether any of the more distal variables were directly related to perceptions of policy, smoking beliefs, or smoking behaviors. Such paths were added only if they were consistent with previous research or theory. Wald tests were used to ascertain whether any relationships could be dropped from the model.

The structural equation analyses were conducted using the maximum likelihood (ML) estimator in EQS 6.1 (Bentler, 1985–2004). Because the data were not normally distributed, robust estimates of the *SE*s and fit statistics were obtained. The ML-based comparative fit index (CFI) and root mean squared error of approximation (RMSEA) were the primary measures used to evaluate model fit (Hu & Bentler, 1999). A CFI value of 0.95 or greater and a RMSEA value of 0.06 or less were considered indicators of good model fit. Indirect effects were estimated as the products of the relevant paths. *SE*s and significance tests for the indirect effects were obtained with the procedures implemented in EQS, using the Sobel (1982) approach.

Results

Structural equation modeling

Measurement model. Past-30-day cigarette smoking was represented by a latent variable with three indicators: frequency of past-30-day cigarette smoking, number of cigarettes smoked in the past 30 days, and frequency of past-30-day cigarette smoking on school property. The unstandardized factor loading for the initial indicator (frequency of cigarette smoking in the past 30 days) was fixed at 1.0 to identify the model. The standardized factor loadings for the three indicators were 0.92, 0.83, and 0.46, respectively. Both free factor loadings were statistically significant ($p < .001$).

Structural model. The hypothesized fully mediated model fit the data only marginally, Satorra–Bentler $\chi^2(48, N = 17,256) = 3,083.32$, $p < .001$, robust CFI = 0.84, RMSEA = 0.061 (90% *CI* = 0.059–0.062). On the basis of the LM tests and theoretical

relevance, paths between some of the background variables and more proximal model variables were added (i.e., paths between age and perceived availability, perceived harm of heavy smoking, and perceived enforcement of school policy; paths between early onset of cigarette smoking and personal disapproval, perceived harm of heavy smoking, and perceived smoking by peers; paths between ethnicity and perceived harm and positive social expectancy; and paths between gender and perceived smoking by peers and perceived harm). Also, on the basis of a nonsignificant Wald test, the path between gender and past-30-day cigarette smoking was dropped from the model. These changes significantly improved the fit of the resulting model, Satorra–Bentler $\Delta\chi^2(9, N=17{,}256)=2{,}146.47$, $p<.001$. Overall, this model fit the data well, Satorra–Bentler $\chi^2(39, N=17{,}256)=936.85$, $p<.001$, robust CFI = 0.95, RMSEA = 0.037 (90% *CI* = 0.035–0.039). The final model with standardized coefficients is shown in Figure 2. Table 3 displays the unstandardized and standardized parameters and associated *SE*s and test statistics.

Direct effects

Smoking. As indicated in Table 3, past-30-day cigarette smoking was directly and positively related to positive social expectancies regarding cigarette smoking and perceived smoking by peers. It was negatively related to personal disapproval of cigarette smoking, perceived harm of heavy cigarette smoking, and perceived availability of tobacco. The unexpected inverse relationship between past-30-day smoking and perceived availability is likely a result of collinearity with the other personal beliefs in the model. Indeed, the relationship between perceived availability and past-30-day cigarette smoking behaviors was positive in the absence of any other variables ($r=.20$). All the background variables except gender were directly related to past-30-day cigarette smoking, even after including theoretically more proximal variables in the model. Increased age, being White, and initiation of cigarette smoking before age 12 were significantly related to past-30-day cigarette smoking.

Smoking beliefs. As expected, direct effects were found from perceived enforcement of school antismoking policies to each of the personal smoking beliefs and from adolescents' perception of community disapproval to each of these beliefs (Table 3). All these effects were consistent with our hypotheses. Specifically, perceived enforcement of school policies and community disapproval were inversely related to expectations of positive social outcomes from cigarette smoking, perceived tobacco availability, and perceived smoking by peers. Conversely, perceived enforcement and community disapproval were positively related to personal disapproval and perceived harm. Age was directly and positively related to both perceived tobacco availability and perceived harm. Also, initiation of cigarette smoking before age 12 was positively related to perceived smoking by peers and inversely related to both perceived harm and personal disapproval of cigarette smoking. Greater perceived harm of heavy smoking and lower positive social expectancies were significantly related to being White. Finally, both perceived harm of heavy smoking and perceived smoking by peers were inversely related to being male.

Perceived enforcement of school policies. As expected, perceived community disapproval of adolescents' cigarette smoking was positively related to perceived enforcement of school antismoking policies. Conversely, age was inversely related to perceived enforcement of school antismoking policies. Other background variables did not directly predict perceived enforcement.

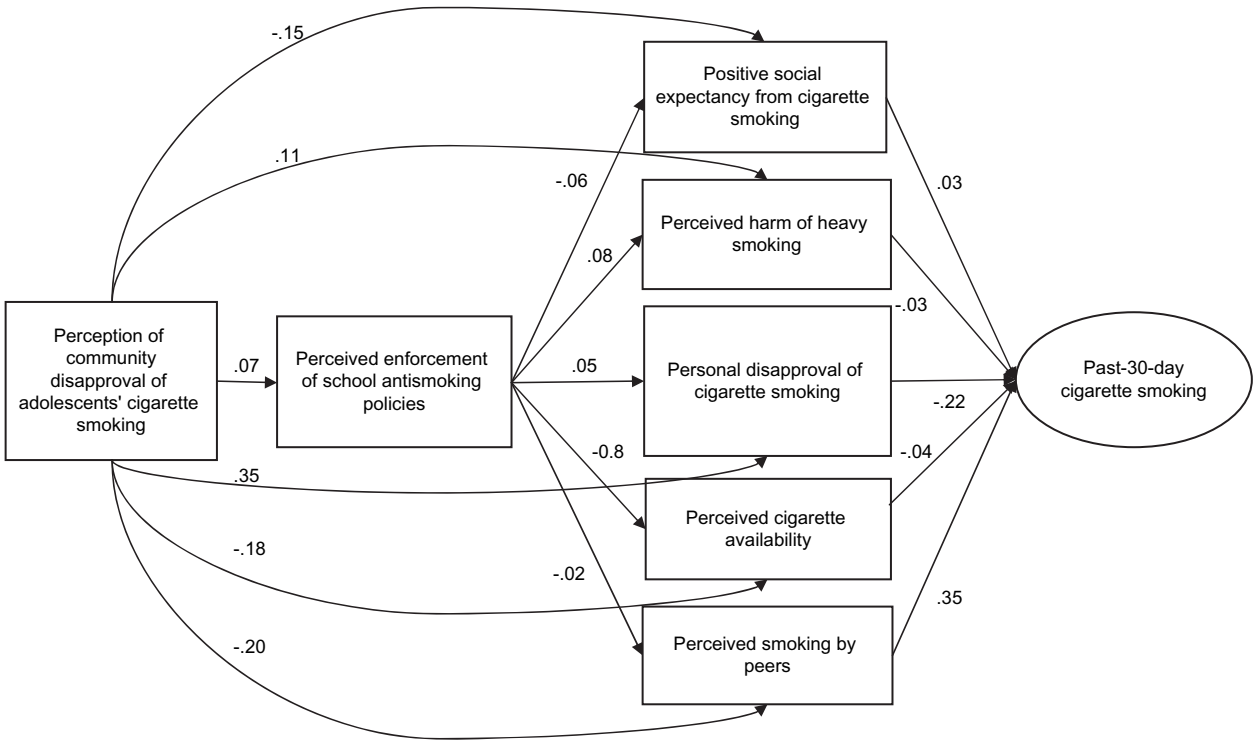

Figure 2. Final structural model of community norms, school antismoking policies, adolescents' personal beliefs, and their smoking behavior. Standardized coefficients are shown.

Table 3. Results from the final structural model to describe the relationships among community disapproval of adolescents' cigarettes smoking, enforcement of school antismoking policies, personal beliefs, and past-30-day cigarette smoking

Dependent variables and predictors	Standardized coefficient	Unstandardized coefficient	*SE*	*t* ratio
Past-30-day cigarette smoking				
Positive social expectancies	0.03	0.22	0.07	3.36*
Perceived harm of heavy smoking	−0.03	−0.16	0.05	−3.01*
Personal disapproval	−0.22	−1.28	0.07	−18.21*
Perceived availability	−0.04	−0.162	0.02	−6.99*
Perceived smoking by peers	0.35	1.46	0.06	25.05*
Age	0.04	0.14	0.02	5.80*
White	0.04	0.50	0.08	6.19*
Initiation of cigarette smoking before age 12	0.16	3.03	0.26	11.82*
($R^2 = .31$)				
Positive social expectancies				
Perceived enforcement of school policies	−0.06	−0.05	0.01	−6.49*
Perception of community disapproval	−0.15	−0.14	0.01	−18.82*
White	−0.09	−0.17	0.01	−11.74*
($R^2 = .04$)				
Perceived harm of heavy smoking				
Perceived enforcement of school policies	0.08	0.08	0.01	8.93*
Perception of community disapproval	0.11	0.11	0.01	13.95*
Male	−0.07	−0.12	0.01	−9.90*
Age	0.12	0.06	0.01	16.07*
White	0.11	0.22	0.02	12.76*
Initiation of cigarette smoking before age 12	−0.09	−0.25	0.03	−10.02
($R^2 = .06$)				
Personal disapproval				
Perceived enforcement of school policies	0.05	0.06	0.01	7.12*
Perception of community disapproval	0.35	0.37	0.01	40.82*
Initiation of cigarette smoking before age 12	−0.14	−0.45	0.03	−16.90*
($R^2 = .16$)				
Perceived availability				
Perceived enforcement of school policies	−0.08	−0.12	0.01	−10.96*
Perception of community disapproval	−0.18	−0.27	0.01	−26.74*
Age	0.29	0.23	0.01	43.43*
($R^2 = .15$)				
Perceived smoking by peers				
Perceived enforcement of school policies	−0.02	−0.03	0.01	−2.50*
Perception of community disapproval	−0.20	−0.31	0.01	−24.09*
Male	−0.07	−0.16	0.02	−10.14*
Initiation of cigarette smoking before age 12	0.14	0.65	0.04	15.76*
($R^2 = .07$)				
Perceived enforcement of school policies				
Perception of community disapproval	0.07	0.07	0.01	8.33*
Age	−0.16	−0.08	0.01	−21.01*
($R^2 = .03$)				

Note. Model fit: comparative fit index (CFI) = 0.95; root mean squared error of approximation (RMSEA) = 0.037 (90% *CI* = 0.035–0.039).
*$p < .001$.

Indirect effects of enforcement of school policy on smoking

The analyses suggest that adolescents' personal beliefs may serve as mediators between perceived enforcement of school antismoking policies and past-30-day cigarette smoking. The estimated effect of perceived enforcement of school antismoking policies on past-30-day smoking was mediated entirely by the more proximal beliefs, although this effect was relatively small ($\beta = -.02$, $p < .001$). Enforcement of school antismoking policies was indirectly and inversely related to past-30-day cigarette smoking through decreased positive social expectancy and decreased perceived smoking by peers. Enforcement of school antismoking policies also was related to past-30-day smoking through increased perceived harm and personal disapproval of

smoking. Overall, perceived enforcement of school antismoking policies and personal beliefs entirely mediated the effects of community disapproval on smoking behavior ($\beta = -.15$, $p < .001$).

Discussion

The results of the present study are largely consistent with the proposed mediational model and contribute to our understanding of whether and how community norms and school antismoking policies relate to adolescents' cigarette smoking. First, we found that school antismoking policies were directly related to community disapproval of adolescents' cigarette smoking. Consistent with other research (Evans-Whipp et al., 2007), our study thus suggests that school antismoking policies may reflect community attitudes about youth cigarette smoking and are more likely to be implemented and enforced when community norms toward youth smoking are less favorable. To provide a better understanding of the relationship between school antismoking policies and adolescents' smoking behavior, future studies should take into account the community context and local tobacco policies and practices. Nonetheless, perceived enforcement of school policies was related to smoking beliefs and behavior above and beyond any effects of community norms. That is, school policies may be important prevention tools in and of themselves.

Our findings also suggest that both community disapproval of adolescents' cigarette smoking and enforcement of school antismoking policies may be related to students' cigarette smoking indirectly through personal beliefs about smoking. Adolescents' beliefs about the availability of tobacco, potential health risks, social benefits of cigarette smoking, peers' smoking, and personal approval of cigarette smoking were directly related to perceived enforcement of school antismoking policies. Specifically, adolescents who perceived school antismoking policies as strictly enforced also believed tobacco was less available, more risky, less socially attractive, less used by their best friends, and less acceptable. These beliefs were directly related to adolescents' past-30-day cigarette smoking. These results suggest that enforcement of antismoking policies by schools may help to shape students' personal beliefs about cigarette smoking and, thus, their smoking behavior. In line with the basic assumptions of a social learning approach, the results also suggest that cigarette smoking behavior may result largely from cognitive processes through which adolescents anticipate the consequences associated with cigarette smoking. Based on these anticipations, they consider the costs and the benefits related to cigarette smoking and behave accordingly.

The finding that adolescents' personal beliefs also are affected by community norms suggests that it is important to provide communities with effective tobacco policies and practices to prevent and control youth tobacco use and to communicate disapproval of smoking to youth. However, evidence regarding the effects of community-level tobacco policies on smoking by young people is mixed. Some studies found no effect of increased compliance with or enforcement of tobacco laws regarding minors (Fichtenberg & Glantz, 2002; Rigotti et al., 1997). Others found reductions in smoking by youth following increased compliance or enforcement efforts (Altman, Wheelis, McFarlane, Lee, & Fortmann, 1999; Biglan, Ary, Smolkowski, Duncan, & Black, 2000; Forster et al., 1998; Jason, Billows, Schnopp-Wyatt, & King, 1996; Jason, Ji, Anes, & Birkhead, 1991; Siegel, Biener, & Rigotti, 1999). Future studies should resolve this issue and examine how and when community tobacco policies and practices influence adolescents' cigarette smoking. Moreover, further research should study in-depth the interplay between community tobacco policies and school tobacco policies and the way they affect adolescents' cigarette smoking behaviors.

The results of the present study should be considered in light of several limitations. The cross-sectional design precludes causal inferences about the relationships that were found. For example, it is possible that smoking affects perceptions of policy, rather than the other way around. That is, students who smoke may learn that enforcement of school tobacco policies is low through direct experience (e.g., not being caught and punished when they smoke at school). Conversely, students who do not smoke may assume that tobacco policies are enforced simply because they have no experience violating the policy. Alternatively, the relationships observed among perceptions of policy, smoking beliefs, and tobacco use may be the result of rationalization processes through which young smokers attribute fewer negative consequences to smoking in order to justify their behavior (e.g., Kunda, 1990). Different conclusions might be drawn from objective measures of enforcement activities and community policies and practices. Future studies should, for example, examine the extent to which official reports of policy enforcement (e.g., reports of school administrators or other key informants) are related to students' perceptions and to smoking behaviors. Finally, although the results of the present study suggest that effects of school tobacco policies may be mediated through personal smoking beliefs, estimates of mediational effects obtained using cross-sectional data can be misleading and may overestimate the size of such effects (Maxwell & Cole, 2007). Future studies should examine these effects across time to allow a better understanding of the relationships among school antismoking policies, community norms, and adolescents' smoking beliefs and behavior.

Despite possible shortcomings, the present study increases our understanding of the processes through which community norms and school antismoking policies may affect smoking among young people. As such, it is an important contribution and has important implications for preventing youth smoking through policy approaches. Our findings also underscore the importance of studying school antismoking policies within a larger social context, including communities and states.

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Declaration of Interests

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