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## Predictors of support among students, faculty and staff for a smoke-free university campus



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### ABSTRACT

**Objectives.** Students, faculty, and staff at a Pacific Northwest public university were surveyed one year after enactment of a smoke-free campus policy. Objectives were to assess levels of support for a smoke-free campus, ascertain exposure levels to outdoor tobacco smoke, and identify correlates of policy support.

**Method.** A 2013 Web-based survey included 5691 students (response rate 26%) and 2051 faculty/staff (response rate 43%). Measures included support for a smoke-free campus, smoking status, exposure to second-hand smoke, and perceptions of levels of policy support and campus smoking. Logistic regression was used to examine predictors of support.

**Results.** Seventy-two percent of students and 77% of faculty/staff supported a smoke-free campus. Respondents reported limited exposure to smoke near building entrances, but exposure near campus boundaries was reported by majorities of students (77%) and faculty/staff (55%). Predictors of students' policy support included never-smoker status, perceived support by peers, perceived student smoking prevalence, campus smoke exposure, and female gender, among others. Predictors of faculty/staff support included never-smoker status, perceived policy support by students and peers, campus smoke exposure, female gender, and age.

**Conclusion.** Students, faculty, and staff were strongly supportive of the existing smoke-free campus policy. However, the policy led to smoking activity shifting to the campus periphery.

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### Introduction

Young adults ages 18–25 are at substantial risk for cigarette smoking and other tobacco use. About one-quarter of this age group are current cigarette smokers (U.S. Department of Health and Human Services, 2014), and young adults are the most likely to use multiple forms of tobacco (Lee et al., 2014). College students, in particular, are a focus of intense recruitment efforts by the tobacco industry through promotional events and other marketing strategies (Hammond et al., 2005; Rigotti et al., 2005). College students are at risk for smoking initiation (Freedman et al., 2012), and those who are already experimental smokers are at particular risk for progression to regular smoking (Gilpin et al., 2005). In addition, large proportions of students are exposed to secondhand smoke (SHS) in outdoor locations, residences, cars, sporting events, bars, and other settings (Wolfson et al., 2009).

In recognition of these concerns, a rapidly growing number of colleges and universities have adopted smoke-free campus policies, an approach strongly supported by the American College Health Association (2012). By October 2014, 1477 colleges and universities had enacted policies making their campuses either smoke-free or completely tobacco-free (American Nonsmokers' Rights Foundation, 2014). However, with over 4800 degree-granting two- and four-year institutions in the United States as of 2012 (National Center for Education Statistics, 2014), fewer than a third of campuses are presently governed by these policies.

Several recent studies have found smoke-free campus policies to be associated with reductions in campus smoking prevalence, secondhand smoke exposure, and student perceptions of peer smoking prevalence, as well as an increase in social norms favoring smoke-free environments (Lechner et al., 2012; Lee et al., 2013; Seo et al., 2011). However, considerable challenges in policy implementation have also been identified, including enforcement difficulties, displacement of smokers to the outskirts of campus, community relations, and safety concerns, among other issues (Baillie et al., 2009, 2011; Fennell, 2012; Procter-Scherdtel and Collins, 2013a; Russette et al., 2014). Thus, despite the increasing number of smoke-free campus policies, there is only limited understanding of how to implement them successfully.

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One important factor influencing the success of smoke-free policies is the level of support from the affected community. Policy support is a key component of the complex process of denormalizing tobacco use that typically accompanies smoking bans (Chapman and Freeman, 2008; Procter-Scherdtel and Collins, 2013b). However, several studies have found that although college students strongly support restrictions on indoor smoking, their support for comprehensive bans—which extend to outdoor spaces—is considerably lower (Hammond et al., 2006; Loukas et al., 2006; Rigotti et al., 2003; Thompson et al., 2006; Wallar et al., 2013). This may present challenges for successful policy implementation. A great deal also needs to be learned about the reactions to smoke-free policies by faculty and staff who comprise the campus workforce. A limitation of research thus far has been the almost exclusive attention on college students within the campus community.

The focus of this article is a smoke-free policy that was enacted at a large public university in the Pacific Northwest in 2012. Prior to the policy, smoking on campus was already prohibited in all indoor spaces as well as outdoors within 30 feet of building entrances. We report findings from a campus-wide survey of students, faculty, and staff, conducted to evaluate the policy at the end of its first year. Our research aims included the following: (1) to assess the levels of support for a smoke-free campus; (2) to ascertain the prevalence of exposure to outdoor tobacco smoke on campus following policy implementation; and (3) to identify correlates of policy support.

We anticipated that policy support might be predicted by several different kinds of variables. One, clearly, was smoking status, since the policy would substantially affect the daily activities of smokers. Another potential predictor was campus exposure to SHS: it was possible that individuals exposed to smoke might be more inclined to favor a smoke-free policy; however, it was also possible that experiencing SHS exposure while a policy is in effect might lead individuals to reject it as ineffective. We also sought to examine the role of subjective social norms (Procter-Scherdtel and Collins, 2013b), including respondents' perceptions of the extent within the campus community of both policy support and tobacco use. In addition, potentially important lifestyle variables for students included on-campus residence and fraternity/sorority membership. Finally, demographic variables of interest included gender and race (for all respondents), university class status and permanent residence (students), and age and type of campus employment (faculty/staff).

## Methods

### Participants

The study's invited student sample included all students who were registered for an on-campus course of one credit or more during the spring 2013 term, plus all students enrolled in the university's international study program regardless of credit status. The invited faculty/staff sample included all individuals who worked on campus at least 20% time during spring 2013, plus employees of the international study program. E-mail addresses were obtained from campus administrative offices for all qualifying students ( $N = 22,141$ ) and all qualifying faculty and staff ( $N = 4820$ ). The student survey had 5691 respondents (26% response rate) while the faculty/staff survey had 2051 respondents (43% response rate).

### Measures

All measures were included on an online, Web-based questionnaire. The primary variables included:

*Support for a smoke-free campus.* Measured with a Likert-type item: "Our campus should be 100% smoke-free." Response options ranged from 1 (strongly disagree) to 7 (strongly agree).

*Smoking status.* Measured with one item producing four categories: never-smoker, former smoker, intermittent smoker, and daily smoker.

*Exposure to secondhand smoke on campus.* Three items asked whether the respondent had been exposed to secondhand smoke in the past two weeks "at an entrance to a campus building," "near the campus boundary, including just

outside campus," and "elsewhere on campus." There were seven response categories, ranging from "Not at all" to "11 + times."

*Perceptions of smoking-related norms.* Both students and faculty/staff were asked to estimate the percentages of students who support the smoke-free campus policy, are cigarette smokers, and use tobacco products other than cigarettes. In addition, faculty/staff were asked to estimate these same percentages with respect to other faculty/staff. Respondents specified individual percentages, which were changed to deciles (0–10%, 11–20%, etc.) for the regression analyses because respondents tended to choose percentages that ended in 0 or 5.

*Demographics and campus life variables.* Demographic items included gender, age, and race. Based on consultation with the university's intercultural student services office, the male and female gender categories were expanded to include a third option, accompanied by a blank space for self-identification. Students also reported their degree/class status, residence status (on-campus, off-campus), place of permanent residence (in-state, out-of-state, international student), and fraternity/sorority membership. Faculty/staff reported their professional position: academic tenure-line faculty, professional faculty (i.e., non-tenured teaching or research), or classified staff.

### Procedures

The study protocol was approved by the campus's Institutional Review Board. In May 2013, e-mail invitations to participate, with a link to the Web survey, were sent from the University President's office to all individuals on both mailing lists. Respondents were promised confidentiality and no identifying information was collected. Reminders were sent one week apart to individuals who had not yet completed the survey. Students received the original message plus three reminders; faculty/staff received the original message plus two reminders. The survey did not include incentives for participation.

### Statistical analyses

Separate analyses were conducted for the student and faculty/staff samples. Poststratification weighting was used to minimize potential nonresponse bias due to differential response rates across demographic subgroups. Student data were weighted by gender and year in school. Faculty/staff data were weighted by gender, age category, and professional position. Statistical analyses used SPSS version 22.

The correlates of support for a smoke-free campus were analyzed using logistic regression, for which the seven response categories were collapsed into two: supportive of the policy vs. opposed or neutral. Logistic regression was considered more appropriate than linear multiple regression because the distribution of responses across categories tended to be irregular and bimodal, with high response frequencies at the ends of the scale. The regression models included, as independent variables, exposure to secondhand smoke on campus, the perceived prevalence variables, smoking status, and demographics. For both the student and faculty/staff analyses, the SHS exposure variables and the perceived prevalence variables were entered into the models as continuous variables. The smoking status and demographic variables were entered as categorical, with the exception of the age category for faculty/staff, which was also continuous.

## Results

In the student sample, 76% were age 25 or younger (Table 1). The majority (79%) were undergraduates. Seventy-eight percent were from in-state and 7% from other countries. Among faculty/staff, 41% were in academic tenure-line positions, 34% were professional faculty, and 25% were classified staff. About 13% of students and 5% of faculty/staff reported smoking daily or intermittently. Regarding gender, a small percentage of both student and faculty/staff respondents (<1%) chose the "other" category. In both cross-tabulations and the regression models, this third category was consistently similar to male respondents, while differing from female respondents, in analyses where males and females differed. Therefore, "male" and "other" were combined in the subsequent analyses.

Overall, the smoke-free campus policy was supported by 72% of students and 77% of faculty/staff, while 22% of students and 17% of faculty/staff opposed the policy (Tables 2 and 3). Examination of the two

**Table 1**  
Demographic characteristics of the student ( $N = 5691$ ) and faculty/staff ( $N = 2051$ ) samples (Spring 2013).

	Students (weighted n, %) <sup>a</sup>	Faculty & staff (weighted n, %) <sup>b</sup>
<i>Gender</i>		
Male	2878 (53.5%)	930 (47.7%)
Female	2446 (45.5)	1012 (51.8)
Other	51 (0.9)	10 (0.5)
<i>Age</i>		
18–21	2366 (45.1)	
22–25	1628 (31.0)	41 (2.1)
26–35	929 (17.7)	381 (19.5)
36–45	191 (3.6)	459 (23.5)
46–55	83 (1.6)	471 (24.2)
56–65	31 (0.6)	534 (27.4)
66 or older	17 (0.3)	64 (3.3)
<i>Race</i>		
Amer. Indian or Alaskan Native	26 (0.5)	8 (0.4)
Asian	481 (9.2)	64 (3.4)
Black or African American	25 (0.5)	8 (0.4)
Native Hawaiian/Pacific Islander	20 (0.4)	3 (0.1)
White	4073 (77.5)	1712 (90.3)
Mixed race	340 (6.5)	36 (1.9)
Other race	292 (5.6)	66 (3.5)
<i>Class status (students only)</i>		
Undergrad: 1st or 2nd year	1204 (22.4)	
Undergrad: 3rd or 4th year	3028 (56.3)	
Graduate student	732 (13.6)	
Not seeking a degree or other	418 (7.8)	
<i>Permanent residence (students)</i>		
In-state	4190 (78.0)	
Out of state, within U.S.	822 (15.3)	
International student	364 (6.8)	
<i>Lives on campus (students)</i>		
Yes	887 (16.5)	
No	4486 (83.5)	
<i>Fraternity or sorority membership (students)</i>		
Yes	560 (10.4)	
No	4808 (89.6)	
<i>Type of work position (faculty/staff)</i>		
Academic (tenure or tenure-track)		801 (41.2)
Academic (non-tenure-track)		660 (34.0)
Classified staff		481 (24.8)
<i>Cigarette smoking status</i>		
Never-smoker	4083 (74.5)	1409 (70.8)
Previous smoker, has quit	703 (12.8)	491 (24.7)
Intermittent smoker, not daily	455 (8.3)	31 (1.6)
Daily smoker	243 (4.4)	60 (3.0)

<sup>a</sup> Student sample weighted for gender and class status. Data not complete for all cases.

<sup>b</sup> Faculty/staff sample weighted for gender, age, and type of work position. Data not complete for all cases.

samples separately by smoking status reveals large differences between nonsmokers and smokers. Eighty percent of nonsmoking students were in support, compared to only 18% of smoking students (Table 2), while 80% of nonsmoking faculty/staff were in support compared to only 11% of smoking faculty/staff (Table 3).

Despite the smoking ban, 29% of students and 18% of faculty/staff had been exposed to secondhand smoke within the past two weeks at campus building entrances (Tables 2 and 3). More striking, 77% of students and 55% of faculty/staff had been exposed near the campus boundary, probably due to smokers going off-campus to smoke.

In both the student and faculty/staff samples, nonsmokers' perceptions of the extent of policy support among their peers were more accurate than smokers' perceptions (Tables 2 and 3). However, among both students and faculty/staff, both smokers and nonsmokers overestimated the percentage of students who smoked cigarettes (student estimate 27%, faculty/staff estimate 26%, compared to the actual

figure of 13%), and faculty/staff overestimated the percentage of faculty/staff who smoke (23%, compared to 5% actual).

Table 4 displays the regression analysis of students' support for a smoke-free campus. The regression analysis model had strong predictive power (Nagelkerke  $R^2 = .54$ ), due in large part to the variables of smoking status (intermittent, daily, and former smokers, all negative compared to never-smokers), female gender, and perceived high prevalence of both students' policy support and students' cigarette smoking. For example, in comparison with the reference group never-smokers, the odds of being in support of the policy were 98% lower for students who were daily smokers (AOR = .02) and 69% lower for students who were former smokers. Other statistically significant predictors included international student status, secondhand smoke exposure near building entrances, fraternity/sorority membership (negative), living on campus (negative), prevalence perceptions of students' smoking of other tobacco products (negative), and smoke exposure near the campus boundary.

Table 5 presents the regression analysis of smoke-free policy support within the faculty/staff sample. Smoking status (never-smoker), female gender, perceived policy support from other faculty/staff, perceived policy support from students, and increasing age were predictive of respondents' support.

## Discussion

### Key findings and interpretations

With a smoke-free campus policy in place, almost three-quarters of students and more than three-quarters of faculty and staff expressed support for the policy. Perception of widespread policy support from one's peers—whether student or campus employee—was a strong predictor of individual support. Both samples substantially overestimated the percentages of smokers on campus. The tendency to overestimate smoking prevalence is noteworthy, as perceived student smoking prevalence was a significant correlate of students' policy support. Follow-up studies are needed to determine the causal pathways underlying this relationship, but the finding highlights the importance of understanding the role of social norms with respect to tobacco control policies (Chapman and Freeman, 2008; Procter-Scherdtel and Collins, 2013b).

The finding that current smoking was strongly associated with policy opposition in both samples was not surprising. But we did find it surprising that being a former smoker also strongly predicted opposition, since these individuals' daily patterns were not disrupted by the policy. The strong gender effect—females more supportive than males—was found in both samples, extending previous research that has found females more generally supportive of tobacco control policies (Berg et al., 2011; Doucet et al., 2007). Several campus lifestyle factors were also significant predictors of students' support: living on campus and fraternity/sorority membership were both associated with opposition to a smoke-free campus.

With the smoking ban in place, the survey revealed distinctive patterns of exposure to secondhand smoke around the campus. Respondents reported some exposure within the past two weeks near building entrances, but exposure near the campus boundary was extensive. These data illustrate that smokers are going to the campus boundary to smoke in order to comply with the policy, a phenomenon reported at other campuses as well (Baillie et al., 2009; Procter-Scherdtel and Collins, 2013a). It is noteworthy that SHS exposure near the campus boundary—a phenomenon that is clearly associated with the existence of the campus policy—predicted policy support among both students and faculty/staff, while exposure near building entrances predicted support only among students and exposure in other locations was not a significant predictor in either sample.

There is little published research on college students' exposure to secondhand smoke (Wolfson et al., 2009), and the issue of potential biases in reports of exposure has not been explored. However, judging from our results, this may be a topic deserving further exploration, as

**Table 2**Policy support, secondhand smoke exposure, and perceptions of prevalence for the student sample ( $n = 5691$ , Spring 2013).

	Total sample		Nonsmokers		Smokers	
	<i>n</i>	Weighted % <sup>a</sup> (95% CI)	<i>n</i>	Weighted % <sup>a</sup> (95% CI)	<i>n</i>	Weighted % <sup>a</sup> (95% CI)
Support for a smoke-free campus	5691		4783		697	
Support		71.6% (.70, .73)		79.6% (.79, .81)		17.6% (.15, .20)
Neutral		6.3 (.06, .07)		5.8 (.05, .06)		7.6 (.06, .10)
Oppose		22.1 (.21, .23)		14.5 (.15, .16)		74.7 (.72, .78)
<i>Exposure to secondhand smoke on campus in past 2 weeks...</i>						
...near building entrances	5656		4758		689	
Not at all		71.4% (.70, .73)		69.9% (.69, .71)		83.3% (.80, .86)
Once or twice		19.4 (.18, .20)		20.7 (.20, .22)		11.0 (.09, .13)
3 or more times		9.2 (.08, .10)		9.4 (.09, .10)		5.7 (.04, .07)
...near campus boundary	5665		4768		691	
Not at all		22.8% (.22, .24)		21.4% (.20, .23)		30.7% (.27, .34)
Once or twice		27.0 (.26, .28)		27.7 (.26, .29)		21.5 (.18, .25)
3 or more times		50.2 (.49, .51)		50.8 (.49, .52)		47.8 (.44, .52)
...elsewhere on campus	5643		4748		688	
Not at all		52.7% (.51, .54)		51.1% (.50, .52)		63.8% (.60, .67)
Once or twice		30.2 (.29, .31)		31.8 (.30, .33)		19.6 (.17, .23)
3 or more times		17.1 (.16, .18)		17.1 (.16, .18)		16.6 (.14, .19)
	<i>n</i>	Mean, SD	<i>n</i>	Mean, SD	<i>n</i>	Mean, SD
Perception of the percent of students who...						
...support the smoke-free campus policy	5407	67.79 (20.51)	4710	70.17 (18.59)	685	51.51 (25.12)
...smoke cigarettes	5428	27.29 (15.69)	4727	26.69 (15.28)	689	31.24 (17.37)
...smoke other tobacco products	5389	32.74 (22.51)	4687	32.23 (22.27)	690	36.16 (23.76)

<sup>a</sup> Student sample weighted for gender and class status.

evidenced by the differences in SHS exposure reported by nonsmokers and smokers. For example, 83% of student smokers reported no exposure near building entrances, compared to only 70% for student nonsmokers; for faculty/staff, 91% of smokers reported no exposure, compared to 82% of nonsmokers. It is possible, though not necessarily

likely, that the higher reported exposure levels of nonsmokers are due to differences in timing or the use of specific buildings; but it must also be considered that some form of measurement bias, e.g., a difference in awareness of secondhand smoke, may be responsible for this difference.

**Table 3**Policy support, secondhand smoke exposure, and perceptions of prevalence for the faculty/staff sample ( $n = 2051$ , Spring 2013).

	Total sample		Nonsmokers		Smokers	
	<i>n</i>	Weighted % (95% CI)	<i>n</i>	Weighted % (95% CI)	<i>n</i>	Weighted % (95% CI)
Support for a smoke-free campus	2051		1898		90	
Support		77.1% (.75, .79)		80.3% (.79, .82)		10.9% (.04, .17)
Neutral		5.8 (.05, .07)		5.4 (.04, .06)		11.8 (.05, .19)
Oppose		17.1 (.15, .19)		14.3 (.13, .16)		77.3 (.69, .86)
<i>Exposure to secondhand smoke on campus in past 2 weeks...</i>						
...near building entrances	2031		1881		89	
Not at all		82.5% (.81, .84)		81.9% (.80, .84)		91.0% (.85, .97)
Once or twice		11.1 (.10, .12)		11.6 (.10, .13)		3.3 (.00, .07)
3 or more times		6.4 (.05, .07)		6.5 (.05, .08)		5.7 (.01, .11)
...near campus boundary	2035		1885		89	
Not at all		45.4% (.43, .48)		45.2% (.43, .47)		40.2% (.30, .51)
Once or twice		26.3 (.24, .28)		26.7 (.25, .29)		17.5 (.09, .26)
3 or more times		28.3 (.26, .30)		28.1 (.26, .30)		42.3 (.32, .53)
...elsewhere on campus	2023		1874		89	
Not at all		72.8% (.71, .75)		72.8% (.71, .75)		75.1% (.66, .84)
Once or twice		19.5 (.18, .21)		19.6 (.18, .21)		16.6 (.09, .25)
3 or more times		7.7 (.07, .09)		7.6 (.06, .09)		8.3 (.02, .14)
	<i>n</i>	Mean, SD	<i>n</i>	Mean, SD	<i>n</i>	Mean, SD
Perception of the percent of students who...						
...support the smoke-free campus policy	1840	67.81 (19.25)	1742	68.51 (18.77)	85	56.29 (22.85)
...smoke cigarettes	1840	25.70 (15.98)	1741	25.14 (15.75)	85	27.41 (13.85)
...smoke other tobacco products	1766	19.78 (16.97)	1669	18.93 (16.37)	80	23.10 (18.34)
Perception of the percent of faculty and staff who...						
...support the smoke-free campus policy	1847	74.93 (19.31)	1747	76.27 (18.47)	86	58.99 (25.13)
...smoke cigarettes	1840	23.40 (16.14)	1740	22.56 (15.88)	86	25.76 (16.94)
...smoke other tobacco products	1763	14.12 (13.77)	1667	13.40 (13.42)	80	15.44 (14.63)

<sup>a</sup> Faculty/staff sample weighted for gender, age, and type of work position.

**Table 4**  
Logistic regression analyses predicting students' support for a smoke-free campus (Spring 2013).<sup>a</sup>

Predictor variable <sup>b</sup>	n <sup>b</sup>	AOR	95% CI
<i>Frequency of campus smoke exposure...<sup>c</sup></i>			
...near building entrances		1.12	1.03, 1.23
...near campus boundary		1.06	1.01, 1.12
...elsewhere on campus		1.08	1.00, 1.16
<i>Perceptions of the percent of students who...<sup>d</sup></i>			
...support the policy		1.94	1.85, 2.04
...smoke cigarettes		1.14	1.06, 1.22
...smoke other tobacco products		0.96	.92, 1.00
<i>Smoking status</i>			
Never-smoker	3983	ref	
Former smoker, has quit	617	0.31	.25, .39
Intermittent smoker	397	0.07	.05, .09
Daily smoker	210	0.02	.01, .03
<i>Gender</i>			
Male or other	2564	ref	
Female	2643	2.54	2.12, 3.03
<i>Class status</i>			
Undergrad—1st or 2nd year	1233	ref	
Undergrad—3rd or 4th year	2824	1.08	.86, 1.36
Graduate student	1039	1.00	.73, 1.37
Noncredit student	111	1.12	.77, 1.63
<i>Student's residence</i>			
In-state	3988	ref	
Out of state, in U.S.	865	1.06	.84, 1.34
International	354	1.91	1.26, 2.91
<i>Living on campus</i>			
No	4248	ref	
Yes	959	0.78	.60, .998
<i>Fraternity/sorority membership</i>			
No	4647	ref	
Yes	560	0.70	.53, .93
<i>Race</i>			
Nonwhite	1240	ref	
White	3967	1.04	.84, 1.28

<sup>a</sup> N = 5207. Nagelkerke R<sup>2</sup> = .542. Student sample weighted for gender and class status.

<sup>b</sup> All predictor variables coded as categorical variables except for the three campus smoke exposure variables and the three social norm (perception) variables. N's are listed for the levels of the categorical variables.

<sup>c</sup> Each of the campus smoke exposure variables refers to smoke exposure in the past two weeks, measured on a seven-point scale from 0 ("Not at all") to 6 ("11+ times").

<sup>d</sup> Values for each of the perception variables are coded in deciles (e.g., 0–10%, 11–20%, etc.).

### Implications for policy interventions

As others have noted, university administrators will be more receptive to policy change if they perceive strong levels of student demand and low levels of potential opposition (Rigotti et al., 2003). Indeed, it has been demonstrated that providing survey evidence of broad student support can be a decisive influence on the decision to implement controls on outdoor smoking (Garg et al., 2011). The sizable majority of students in support of outdoor smoking restrictions in the present study is higher than the level of support reported in some previous research (Loukas et al., 2006; Rigotti et al., 2003; Thompson et al., 2006). This difference might be due either to a growing acceptance of outdoor smoking bans in the years since the prior surveys, or to these students' positive attitudes toward the smoke-free policy that already exists on their campus. Going beyond students, this study found that the majority of the campus workforce is supportive as well. Furthermore, by identifying correlates of policy support, these findings can suggest groups on campus who can be engaged in communications to facilitate policy implementation. For example, fraternity/sorority membership, which

**Table 5**  
Logistic regression analyses predicting faculty and staff members' support for a smoke-free campus (Spring 2013).<sup>a</sup>

Predictor variable <sup>b</sup>	n <sup>b</sup>	AOR	95% CI
<i>Frequency of campus smoke exposure...<sup>c</sup></i>			
...near building entrances		1.01	.85, 1.22
...near campus boundary		1.18	1.06, 1.30
...elsewhere on campus		1.05	.89, 1.23
<i>Perceptions of the percent of students who...<sup>d</sup></i>			
...support the policy		1.25	1.14, 1.38
...smoke cigarettes		1.10	.96, 1.26
...smoke other tobacco products		0.93	.81, 1.06
<i>Perceptions of the percent of faculty and staff who...<sup>d</sup></i>			
...support the policy		1.45	1.32, 1.60
...smoke cigarettes		1.09	.95, 1.24
...smoke other tobacco products		1.02	.86, 1.21
<i>Age category</i>			
		1.25	1.11, 1.41
<i>Smoking status</i>			
Never-smoker	1192	ref	
Former smoker, has quit	410	0.34	.25, .46
Intermittent smoker	25	0.07	.03, .17
Daily smoker	48	0.01	.002, .03
<i>Gender</i>			
Male or other	686	ref	
Female	989	1.78	1.33, 2.37
<i>Position</i>			
Academic faculty	514	ref	
Professional faculty	678	1.04	.75, 1.45
Classified staff	483	0.89	.61, 1.28
<i>Race</i>			
Nonwhite	184	ref	
White	1491	1.25	.83, 1.88

<sup>a</sup> N = 1675. Nagelkerke R<sup>2</sup> = .397. Faculty/staff sample weighted for gender, age, and type of work position.

<sup>b</sup> All predictor variables coded as categorical variables except for the three campus smoke exposure variables, the six social norm (perception) variables, and age category. N's are listed for the levels of the categorical variables.

<sup>c</sup> Each of the campus smoke exposure variables refers to smoke exposure in the past two weeks, measured on a seven-point scale from 0 ("Not at all") to 6 ("11+ times").

<sup>d</sup> Values for each of the perception variables are coded in deciles (e.g., 0–10%, 11–20%, etc.).

was associated with greater opposition to a smoke-free campus, has been previously found to be also associated with higher levels of smoking and other health-compromising behaviors (Cheney et al., 2014; McCabe et al., 2005; Scott-Sheldon et al., 2008). Thus this group might be particularly resistant to efforts to build policy support.

As discussed above, the introduction of smoke-free campus policies can entail a number of challenges; one of the most significant is the proliferation of smoking and SHS exposure at the campus perimeter. Notably, this phenomenon is a result of smokers' compliance with the policy rather than their violation of it. On our campus, a debate has arisen as to the advisability of placing outdoor cigarette butt receptacles at selected locations along the campus periphery where smokers currently congregate. On one hand, this may be viewed as a reasonable accommodation for those smokers who do not intend to quit but are making good-faith efforts to comply; alternatively, however, concerns have been expressed that these receptacles may serve as an explicit encouragement to smoke in these areas, thus unintentionally exacerbating the problem of second-hand smoke exposure for those entering campus. This ongoing debate serves to illustrate the challenges that can accompany thoughtful policy implementation.

### Study limitations and strengths

The most significant limitation of this study is the low response rates of the two surveys (26% students, 43% faculty/staff), despite the use of

multiple follow-ups, thus introducing the possibility of nonresponse bias. Unfortunately, resources were not available to provide incentives for responding. It should be noted that the student response rate that we obtained is comparable to other Web-based college surveys. For example, the 2013 National College Health Assessment, which allowed participating institutions to use either Web or paper modes, reported a mean response rate of 18% for those institutions using Web administration (American College Health Association, 2013). Other recent tobacco-related survey studies have reported response rates between 19% and 31%, including even some cases where a gift or raffle entry has been offered to encourage response (Berg et al., 2011; Burns et al., 2013; Garg et al., 2011; Primack et al., 2013; Reed et al., 2007; Wolfson et al., 2009). More generally, these results may be indicative of the larger trend toward reduced survey participation that has been described by survey researchers in recent years (Kim et al., 2011).

In the present study, in addition to sending multiple contacts at weekly intervals to reduce nonresponse, we used poststratification weights to minimize nonresponse bias through statistical adjustments. Nevertheless, the representativeness of our student and faculty/staff samples cannot be assumed, and the findings must be interpreted cautiously with regard to their potential applicability to those segments of the campus community—students, faculty, and staff—who were not represented in the completed samples. Encouragingly, however, campus-based studies that combine Web and paper formats have reported that the different modalities produce comparable estimates of student health behaviors and demographics (An et al., 2007; McCabe et al., 2006; Thompson et al., 2006). These results provide some assurance that the low response rates associated with Web surveys may not be producing excessively high levels of nonresponse bias.

A second limitation is that data were self-reported and may have been subject to several forms of response bias. For example, it is possible that awareness of the smoke-free policy influenced some respondents to underreport smoking, despite assurances that the survey did not collect identifying information. However, the estimate of student smoking prevalence (13%) seems reasonable in light of the nationwide estimate of 30-day smoking prevalence from the National College Health Assessment (14% in 2013; American College Health Association, 2013), particularly considering that the West has the lowest prevalence of adolescent and young adult smoking (U.S. Department of Health and Human Services, 2014). These considerations suggest that underreporting is not a major concern. Third, the findings are from a single university campus. Finally, due to this study's cross-sectional design, covering only one point in time, no inferences of causality can be made from these findings. For example, several competing hypotheses may be offered to explain the strong predictive relationship between prevalence perceptions and policy support.

The study has several strengths. First, it examines policy support in the context of an existing, rather than hypothetical, smoke-free policy. Second, it includes campus employees as well as students, who are the exclusive focus of most prior studies. Third, the survey sampling frame included the entire campus community rather than selected subsets of respondents.

## Conclusion

The growing impetus for campus policies that restrict outdoor smoking has considerable potential for reducing tobacco initiation and use by young adults, as well as for promoting cessation by smokers on campus. This study found that a recently enacted smoke-free campus policy has wide support from students, faculty, and staff. Among the identified correlates of support, several may be potentially useful for building communication and educational campaigns. Notably, exposure to secondhand smoke within the campus community has not been eliminated. Further research is needed to determine how to promote smoke-free policies, how to build support, and how to make them maximally effective.

## Conflict of interest statement

The authors declare that there are no conflicts of interest.

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