Demographic differences in support for smoking policy interventions

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Abstract

The Smoking Policy Inventory (SPI) is a 35-item scale, which measures attitudes towards tobacco control policies. The five dimensions of the SPI are advertising and promotion, public education, laws and penalties, taxes and fees, and restrictions on smoking. The SPI has been applied to different samples, both in the USA and internationally. However, no one has investigated if there is differential support for policy intervention among subgroups within the USA. This study investigated subgroup differences on five demographic variables (gender, age, race, ethnicity, and education) across the five dimensions of the SPI. A random digit dial sample of 506 adult participants from the United States was analyzed with five MANOVAs and follow-up ANOVAs. Men (N=188) had significantly (p<0.05) less favorable attitudes towards tobacco control policies than women (N=317) on all five scales. Blacks (N=52) had significantly (p<0.05) more favorable attitudes than whites (N=410) on increasing public education. There were no significant differences between Hispanics (N=21) and non-Hispanics (N=469). Older people were significantly (p<0.05) more supportive of restrictions on advertising and promotion, increasing public education, and increasing environmental restrictions. More educated people were significantly (p<0.05) more supportive of increasing taxes and fees and increasing environmental restrictions. These subgroup differences could be employed to guide the targeting of changes in policies and interventions to the specific concerns of the various groups.

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Of the people alive in the world today, 500 million are predicted to die from the use of tobacco (Petro & Lopez, 1990). They will lose an average of 10 years of life. Consequently, 5 billion years of human life will be lost to one behavior. Modest breakthroughs in interventions with greater impact on populations of smokers could prevent millions of premature deaths and billions of lost years of life. Interventions designed to reduce smoking rates can be classified as operating at the biological level (i.e., nicotine replacement therapy and zyban), the individual level (i.e., tailored interventions, telephone counseling, individual behavioral therapies), or at the social influence level. The latter interventions are often described as policy-level interventions and typically involve changes in laws to discourage smoking, e.g., banning advertising or increasing the cost of tobacco products.

Policy research has often focused on the effects of changes in specific policies. However, an important aspect of a successful intervention is its acceptability of the intervention to the general population that is being affected. If an intervention is viewed as very unacceptable, resistance may cause a reversal of the implementation of the intervention. The limited research on factors that influence support for tobacco control suggests that important population differences do exist. This work has shown that knowledge of smoking-related health problems, and support for tobacco control policies, is greater among nonsmokers than among smokers (Ashley, Bull, & Pederson, 1995; Cohen et al., 2002; Laforge et al., 1998; McAllister, 1995; Velicer, Lafort, Levesque, & Fava, 1994). For example, studies have found that current smokers, heavy smokers, and people who have friends and relatives who are smokers are less likely than others to support tobacco control policies (Velicer et al., 1994). However, smokers are not homogenously opposed to all tobacco control policy (MMWR Weekly Reporter, 1991; Velicer et al., 1994). Even among smokers substantial support has been observed for some measures, such as educational programs, warning labels, and policies restricting marketing to minors (Keller, Weimer-Hablitzel, Kaluza, & Basler, 2002; Lafort et al., 1998; Velicer et al., 1994). Smokers who are not intending to stop smoking in the near future, those who smoke more, and those whose social environments facilitate or condone smoking tend to be less supportive of most tobacco control policies than other smokers. There is, however, relatively little research data on how other social and epidemiologic characteristics influence the degree of support for tobacco control policies.

There is a clear and pressing need for more systematic research assessing support for tobacco control policies in diverse populations, as well as how observed differences in support across social and epidemiological characteristics can inform effective policy implementation (Wakefield & Chaloupka, 1998). Available research offers few valid standardized measures (Alcaiti et al., 1998; Velicer et al., 1994) that can be used for monitoring temporal or population group change, or for cross-cultural comparisons. Most information on tobacco control policy support comes from studies and polls that assess support by a single item or a small set of items, typically reflecting only a narrow segment of tobacco control policies. There is little consistency in the content or use of these measures over time, thereby limiting the ability to monitor changes in population sentiment. Moreover, the ability to compare across communities and studies is limited.

Velicer et al. (1994) have developed a more general, psychometrically sound, survey instrument for assessing smoking policy support. This instrument addresses many of the previously stated problems such as providing reliable assessment across multiple domains of tobacco control policy that can be used to discriminate between population groups, and is useful for cross-cultural comparisons. This study investigates demographic subgroup differences in a representative USA sample.
1. Methods

1.1. Measures

The Smoking Policy Inventory (SPI) is a 35-item scale that includes five dimensions: advertising and promotion, public education, laws and penalties, taxes and fees, and restrictions on smoking. These dimensions include questions about participant attitudes towards tobacco control policies. There is evidence to support this instrument is internally consistent and valid across different populations (Laforge et al., 1998; Velicer et al., 1994). The first dimension assesses participant attitudes about restricting advertising and promotion to make smoking less appealing. The second dimension assesses attitudes of methods to educate people about smoking. The third dimension, laws and penalties, assesses the attitudes towards enforcement of laws regarding selling, purchasing, and smoking cigarettes. The fourth dimension deals with increases in taxes and fees of tobacco advertising, purchasing, and production. The last dimension deals with restrictions on smoking in the workplace, public buildings, and other areas. The questions use a five-point Likert scale (1=disagree completely to 5=agree completely). A high score on the SPI would indicate favorable attitudes towards smoking policies, while a low score indicates less favorable attitudes (Table 1).

1.2. Procedures

A random digit dial system was used to recruit participants from the USA between January and April of 1995. Telephone interviewers at the Survey Research Center at the University of Rhode Island administered the survey. Only English speaking respondents were eligible. Interviewers were trained, certified, and monitored in the appropriate use of standardized survey interviewing procedures (Fowler & Magione, 1990). The survey had a household response rate of 73%, with 11% of contacts actively refusing to participate, and 8% did not answer the scheduled call back. A modification of the “next birthday method” was used for adults age 18 and older to select the household member invited to complete the survey (O’Rourke & Blaire, 1983; Salmon & Nichols, 1983). Respondents were told they were randomly selected and asked to complete an anonymous survey on health behaviors and attitudes. A 65-item survey on health behaviors and attitudes was administered in addition to the SPI. This survey included measures of demographics and health behaviors (such as smoking). Both the SPI and health behaviors were administered over the phone using the computer-assisted telephone interviewing (CATI) system.

1.3. Subjects

A total of 506 English-speaking adult participants from the United States completed the SPI questionnaire. The age range of these participants was from 18 to 80 with a mean age of 43. Approximately 112 (22%) of these participants reported that they currently smoke cigarettes. The study sample has proportionately more females (63% vs. 50% nationally) and whites (82% vs. 75%), but fewer African Americans (10% vs. 12%) and Hispanics (4% vs. 12.5%). It is likely that the modification of the “next-birthday” respondent selection method applied in this study resulted in the disproportionate recruitment of female respondents, due to the tendency of females to be more likely than males to answer the telephone and respond to telephone surveys. The English language eligibility requirement may have been a barrier to inclusion of more Hispanic respondents.
Table 1
Smoking Policy Inventory (SPI) items by the five scales

I. Advertising and promotion
1. Tobacco products should not be advertised at the front of the store.
2. Tobacco companies should not be allowed to offer promotional items (t-shirts or free cigarettes) to encourage the purchase of cigarettes.
3. Tobacco advertising should not be allowed to make cigarette smoking look relaxing or fun.
4. Cigarette advertising on billboards and in the media should be banned.
5. Advertising cigarettes on shirts, jeans, and other clothing should be banned.
6. Advertising tobacco products at sports and athletic events should be banned.
7. All cigarette advertising should be banned.

II. Public education
8. The federal government should provide funding to help promote stop-smoking techniques.
9. Parents should be educated about the dangers of second-hand smoke to children.
10. Physicians should educate their patients about the health risks of smoking.
11. New mothers should have to undergo training on the health risks of smoking for themselves and for their children.
12. Public places that allow smoking should be required to post a sign warning of the health hazards of smoking.
13. Physicians should their patients about the health benefits of not smoking.
14. The dangers on second-hand smoke should be publicized.

III. Laws and penalties
15. Minors caught buying cigarettes should be fined.
16. People who sell tobacco to minors should be prosecuted.
17. Local police should strongly enforce laws against tobacco sales to minors.
18. Laws should impose financial penalties for the sale of tobacco products to minors.
19. A license should be required to sell cigarettes.
20. Store owners should need a license to sell cigarettes (just like alcoholic beverages).
21. Penalties should be gradually increased for store owners who repeatedly sell cigarettes to minors.

IV. Taxes and fees
22. The costs of cigarette advertising should be increased to discourage manufacturers from advertising.
23. The government should increase capital gains taxes on tobacco products as a way of curbing tobacco production.
24. Taxes on cigarettes should be increased to discourage smoking.
25. The government should place a large tax on cigarette advertising.
26. Taxes on cigarettes should be increased to prevent youth from acquiring the smoking habit.
27. Taxes on cigarettes should be increased to pay for smoke-related health care costs.
28. The federal tax rate on cigarettes should be increased.

V. Restrictions on smoking
29. Smoking should be banned in all restaurants and cafeterias.
30. Smoking in public places should be illegal.
31. Smoking should be banned in all public buildings.
32. All work sites should be smoke-free.
33. Smokers should be allowed to smoke in public buildings.
34. Smokers should be able to smoke at work sites.
35. Smoking should be banned on all public transportation.
There were a total of 488 participants in the age ANOVA. This investigator examined the relation between the SPI and demographic data for these participants. These demographics included: gender, race, ethnicity, age, and education (see Table 2). It should be noted that the sample sizes were different with each ANOVA, due to missing data. The ANOVA for gender included 188 men (37.2%) and 317 women (62.8%). There were 52 blacks and 410 whites. There were 21 Hispanics. There were five age groups: (a) 18–25-year-olds \((N=65)\), (b) 26–35-year-olds \((N=122)\), (c) 36–45-year-olds \((N=121)\), (d) 46–55-year-olds \((N=80)\), and (e) 56 and older \((N=100)\). The five education groups were: (a) less than 12 \((N=37)\), (b) 12 years \((N=160)\), (c) greater than 12 and less than 17 \((N=248)\), and (d) 18 or greater \((N=61)\).

### 2. Results

#### 2.1. Analysis

A one-way analysis of variance was conducted for each of the five demographic variables on the each of the five dimensions of the SPI. Additional analysis investigated all potential second and third order interactions.

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<tr>
<th>Table 2 Means and standard deviations of the five scales of the Smoking Policy Inventory (SPI) by demographic subgroup</th>
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<td><strong>Part I. Gender</strong></td>
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<td><strong>Part V. Education</strong></td>
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2.2. Gender

The gender variable provided evidence of significant differences between men and women on the five dimensions. This sample included 188 (37%) men and 317 women (63%). Of the five dimensions, there was a significant difference between the way in which women and men responded on all of them. Advertisement and promotion, $F(1,503)=28.829$, $p<0.001$, $\omega^2=0.05$; public education, $F(1,502)=5.649$, $p<0.01$, $\omega^2=0.01$; laws and penalties, $F(1,500)=3.796$, $p<0.05$, $\omega^2=0.008$; taxes and fees, $F(1,497)=19.322$, $p<0.001$, $\omega^2=0.04$; and environmental restrictions, $F(1,497)=4.291$, $p<0.05$, $\omega^2=0.009$. There was also a significant effect in the overall total SPI score, $F(1,486)=18.708$, $p<0.001$, $\omega^2=0.04$. Men tended to generate lower scores, which indicates less favorable attitudes towards tobacco control policies.

2.3. Age

The age variable was categorized into five groups (18–25, 26–35, 36–45, 46–55, and 56–older). This sample included 506 participants, 18 of which were eliminated due to missing data. There was a significance between age groups on three of the five dimensions, advertising and promotion, $F(4,486)=11.134$, $p<0.001$, $\omega^2=0.08$; public education, $F(4,485)=2.375$, $p<0.05$, $\omega^2=0.02$; and environmental restrictions, $F(4,481)=2.787$, $p<0.05$, $\omega^2=0.02$. There were no significant differences on the two dimensions of laws and penalties, $F(4,483)=1.343$, $p>0.05$, $\omega^2=0.01$, and taxes and fees, $F(4,480)=1.439$, $p>0.05$, $\omega^2=0.01$. Although, there was an overall significance in the total SPI score, $F(4,470)=3.598$, $p=0.01$, $\omega^2=0.03$. SPI scores tended to increase with age, indicating more favorable attitudes with older participants.

2.4. Race

The race variable included 52 black (4.2%) and 410 white (95.8%) participants. There were significant findings for public education, $F(1,459)=5.166$, $p<0.05$, $\omega^2=0.01$. There were no significant findings for: ads and promotion, $F(1,461)=0.439$, $p>0.05$, $\omega^2=0.009$; laws and penalties, $F(1,458)=0.335$, $p>0.05$, $\omega^2=0.0007$; taxes and fees, $F(1,454)=1.558$, $p>0.05$, $\omega^2=0.003$; and environmental restrictions, $F(1,454)=3.557$, $p>0.05$, $\omega^2=0.008$. Blacks tended to score higher, which suggests more favorable attitudes towards smoking policies in general.

2.5. Ethnicity

The demographic variable for ethnicity asked participants if they were Hispanic/Latino or not. Twenty-one respondents indicated that they were Hispanic/Latino and 475 indicated that they were not. There were no significant findings or effect sizes for this variable [advertisement and promotion, $F(1,495)=0.056$, $p>0.05$, $\omega^2=0.0001$; public education, $F(1,494)=1.456$, $p>0.05$, $\omega^2=0.003$; laws and penalties, $F(1,492)=0.081$, $p>0.05$, $\omega^2=0.0001$; taxes and fees, $F(1,489)=1.496$, $p>0.05$, $\omega^2=0.003$; and environmental restrictions, $F(1,489)=1.211$, $p>0.05$, $\omega^2=0.002$]. Due to the low number of participants that identified themselves as Latino, trends were difficult to determine from this variable.
2.6. Education

The education variable was divided into four categories, which included: less than high school, high school degree, some college, and graduate studies. There were significant findings for taxes and fees, $F(3,498)=2.891$, $p<0.05$, $\omega^2=0.02$, and environmental restrictions, $F(3,498)=5.721$, $p<0.001$, $\omega^2=0.03$. There were no significant findings for advertising and promotion, $F(3,504)=0.540$, $p>0.05$, $\omega^2=0.003$; public education, $F(3,503)=0.322$, $p>0.05$, $\omega^2=0.002$; and laws and penalties, $F(3,501)=1.068$, $p>0.05$, $\omega^2=0.006$. On the dimensions taxes and fees and environmental restrictions, those with higher education scored higher on the SPI. These findings will be interpreted in the discussion section.

2.7. Higher order analysis

In addition to the analyzing the each demographic separately, we combined each of the demographics for pairwise and three-way comparisons. Pairwise combinations of the five demographic variables were examined, resulting in 10 two-way MANOVAs tested on the five dimensions of the SPI for a total of fifty tests. Four were significant but revealed small effect sizes and inconsistent results. It was decided that these findings were likely due to type I errors and therefore, no interpretations are presented here. Three-way comparisons of the five demographics were also tested, resulting in five three-way MANOVAs. None of these comparisons were significant (Figs. 1–4).

3. Discussion

The purpose of this study was to investigate subgroup differences across the five dimensions of the Smoking Policy Inventory. There were four noteworthy findings. One, women had significantly more positive attitudes towards smoking policies in comparison to men. This was the only demographic variable in which each dimension was significantly different between groups. Two, there was a trend for Black participants showing more favorable attitudes than whites, especially on the public education dimension. Third, older participants tended to have more favorable attitudes than younger participants. Lastly, the more education a participant acquired was associated with more favorable attitudes.
It is important to understand the possible implications of these findings. Women smoking rates have increased in the past decade, so why is it that they endorse more favorable attitudes towards smoking policies? Although the smoking status of individuals was not analyzed, we know that approximately 22% of the sample were smokers. Past studies have found that those individuals that smoke have less favorable attitudes towards policies than non-smokers (Velicer et al., 1994). So we can assume that the majority of women that endorsed positive attitudes were non-smokers. However, the question still remains why? Traditionally, women are more likely to be exposed to smoke as an occupational hazard, which may be in part due to higher rates of less educated individuals in this group. Women work in more environments (compared to men) that are less protected under smoking policies like designated smoking areas. As a result, women in general are less protected. More favorable attitudes on the SPI could be a means to level the playing field.

Blacks had a tendency towards more favorable attitudes compared to whites in this sample. We could hypothesize that this may be due to similar reasons that women scored high on the SPI. Historically, blacks have been overrepresented at or below poverty level, which indicates similar working environments with women. Again, these environments are less protected. Both blacks and women have had limited influence on policy making. First, in the majority of both groups, there is often not enough time to provide for your family and be an activist. Secondly, in unprotected

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**Fig. 2.** Means of the five scales of the Smoking Policy Inventory (SPI) by race.

**Fig. 3.** Means of the five scales of Smoking Policy Inventory (SPI) by age.
environments, there is probably a fear of getting fired because of the request for protection. Although these are possible implications, future research should explore other reasons for these differences.

It seems somewhat intuitive that older participants would have more favorable attitudes towards smoking policies. For the most part, older participants are more knowledgeable about smoking and the risks associated with it. In addition, older smokers are more likely to be experiencing the negative consequences of their habit like various cancers, lung diseases, and heart problems. They would more likely support smoking policies that would have lessened their negative experiences. A large number of individuals begin smoking in adolescence or early adulthood (age 13–25), so the lessened support for policies that would infringe on their freedom of smoking is predictable.

There was also a trend in the education demographic indicating that the more education an individual had, the more likely they were to endorse positive attitudes of smoking policies. Similar to age, these findings are somewhat intuitive because with education comes general knowledge. This knowledge often includes information about health and self-awareness, which may not support unhealthy choices like smoking.

There were few limitations to this study. One, which was addressed in previous SPI research, is the question of whether the inventory covers all smoking policies. Are there important policies that were omitted? The original investigators used samples not only in the U.S., but internationally, so the likelihood is the major policies were addressed in the 35-item SPI. Also, there may be a concern about whether the sample was representative. Even though a random-digit dial procedure was employed to get the most representative sample possible, the sample departed in several ways from the actual make up of the U.S. population (under sampling of males and Hispanics).

There are many potential implications here, which will help guide additional research in the field of smoking attitudes. Subgroup differences could guide the targeting of changes in policies and interventions to the specific concerns of these and other potentially underrepresented groups.

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