

Smoking Cessation Interventions for University Students: Recruitment and Program Design Considerations Based on Social Marketing Theory¹

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Background. Audience variables with social marketing implications for university campuses were investigated to identify prepromotional campaign strategies for the design of smoking cessation interventions and for subject recruitment.

Methods. A first survey based on a stratified systematic probability sample of 2,998 college students at a large midwestern university identified 313 smokers. A total of 263 (response rate = 84%) participated in a second telephone survey, and results were based on the 193 (73%) respondents who still smoked.

Results. Recruitment implications indicate that potential participants are predominantly lower classmen in their early 20s who are unmarried, childless, white, full-time domestic students. Smoking habits are moderate but well-established and confined almost exclusively to cigarette smoking. An average of three attempts to quit smoking was reported, and the majority of respondents rated their interest and intention to quit as "somewhat" to "very likely." The best publicity options for programs are campus newspapers as well as grocery stores and gas stations, where most cigarettes are purchased. Program design implications suggest that accessibility, affordability, convenience, flexibility, social support, and behavioral prompts/cues are important factors to consider.

Conclusions. This study is a first initiative to "fill the gap" in the social marketing research literature by providing recruitment and program design information specifically for developing a smoking cessation campaign for university campuses. © 1993 Academic Press, Inc.

INTRODUCTION

Reduction or cessation of tobacco use among university students is an exigent public health priority. Nearly 2 million college students smoke (1, 2), and incidence rates have increased in the past decade, especially among women and minority college students (3, 4). Tobacco use is the leading preventable cause of death in the United States; mortality is higher for cigarette smoking than for deaths caused by illicit drug use, automobile crashes, homicides, suicides, and AIDS combined (1, 5, 6). Because smoking habits may be relatively less en-

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trenched in younger smokers, behavior change in a college-age population may be easier to effect (7). Student smokers may be disposed to quit smoking, as students are generally aware of the major health risks associated with smoking. In addition, 78% of college smokers have made previous quit attempts (8).

Prepromotion and preproduction information is needed to recruit and design effective programs for university students. Atkin and Freimuth (9) reported that education and persuasion campaigns with various populations have achieved only limited success. The reasons they list for the ineffectiveness of campaigns is that most were underdeveloped at the preparation, production, and dissemination phases of implementation due to poor conceptualization and inadequate formative research. Formative information pertaining to recruitment and program design would be valuable because, if university smokers will not enroll in programs, the purpose of the intervention is compromised and treatment efficacy is jeopardized (10, 11).

Social marketing principles based on appropriate prepromotional and preproduction information can aid in designing smoking cessation programs relevant to university students (9–16). Of benefit would be data related to audience segmentation (specific subgroups of the audience) and four basic marketing decision variables, known as the marketing mix or the four P's: *Product*, *Price*, *Place*, and *Promotion*. *Product* decisions refer to the design of the product/service and its desirability to the target audience. *Price* covers the various costs that a person must accept in order to participate in the program. *Place* refers to the channels of distribution for delivering the product/program to the participant. Finally, *promotion* addresses strategies and tactics for communicating with the target audience about the program and persuading the audience to participate. Promotion includes advertising, personal selling, publicity, and "sales promotion" (special events or incentives to stimulate audience interest and acceptance).

Prior social marketing campaigns have been designed for the general public (14–16), but no studies have considered the application of social marketing principles for recruitment of participants and design of smoking cessation programs specifically for university students. The purpose of this study was to assess appropriate prepromotion and preproduction information based on social marketing principles in order to recruit and design smoking cessation campaigns for university populations. The goal was to collect data pertaining to audience variables that characterized the audience and provide information for marketing mix decisions (i.e., the four P's).

METHOD

Target Audience

A two-phase survey was administered at a large midwestern university. The first survey was given to a stratified (by class and gender) systematic probability sample of 3,880 full- and part-time undergraduate and graduate students (response rate = 77.3%, $n = 2,998$). Subsidiary analyses indicated that the sex and class rank characteristics of the respondents were equivalent to those of the entire

university population. The sample and the population bivariate distribution on sex and class rank differed by only an average of 0.93% per cell. The second survey was administered to all 313 students who identified themselves as smokers on the first survey (response rate = 84.0%, $n = 263$). There were 193 (73.3%) students who identified themselves as current smokers on the second survey (i.e., smoked more than once per month), and results for these students are reported.

Procedure

*Second-phase/smokers survey.*³ Telephone interviews were conducted by undergraduate research assistants 1 day to 3 weeks after the first survey was returned. All interviewers were trained and closely supervised by a faculty member and graduate student project supervisors.

Stability was established by comparing the number of cigarettes smoked per day reported on the first survey with the number reported on the second. A Pearson correlation coefficient indicated that the number of cigarettes reported on the two occasions was relatively consistent, $r(191) = 0.87$, $P < 0.0001$.

Audience segmentation variables. Data were collected for several audience segmentation variables. These variables (see Table 1) included demographic characteristics, social role position, behavioral risk profile, and psychographic attributes.

Marketing mix. Tables 2 to 5 present data relevant to social marketing mix decisions or the four P's.⁴

Data Analyses

Descriptive statistics (means, standard deviations, percentages, and correlations), t tests, and χ^2 analyses were computed to summarize data pertaining to each of the audience variables.

RESULTS

Audience Segmentation

Demographic variables. Table 1 indicates that smokers, on average, were in their early twenties. The age range in this sample is typical of universities nationally because of the increasing number of older students who are attending college (17, 18). There were slightly more men than women who smoked and more freshman representatives than students from the four other classes. Table 1 also shows that almost all smokers were unmarried, childless, white, full-time, domestic students.

Smokers and nonsmokers in the initial sample were compared with regard to the

³ The questionnaire is available from the authors.

⁴ Some variables might be listed under more than one category. For example, motivation could be listed under Price because it may be viewed as a cost to the consumer. Motivation also could be listed under Product because information is provided about the need for motivational techniques. In this study, it was listed under Product.

TABLE 1
AUDIENCE SEGMENTATION VARIABLES

Characteristic	<i>n</i> ^a	%	<i>M/SD</i> ^b
Demographic variables			
Age (years)			23.4/6.4
18	25	13.2	
19	35	18.5	
20	24	12.7	
21	29	15.3	
22	13	6.9	
23-67	63	33.3	
Sex			
Male	105	54.4	
Female	88	45.6	
Class rank			
Freshman	54	28.0	
Sophomore	38	19.7	
Junior	38	19.7	
Senior	37	19.2	
Graduate ^c	25	13.0	
Enrollment status			
Full-time	180	93.3	
Part-time	13	6.7	
Citizenship			
U.S.A.	175	90.7	
Other	18	9.3	
Ethnic background			
White	175	90.7	
Other	18	9.3	
Marital status			
Single	164	85.0	
Married	29	15.0	
Number of children			
Childless	179	92.7	
1 or more	14	7.3	
Social role position			
Residence location			
Off campus	103	53.4	
On campus	90	46.6	
Type of housing			
Off campus			
Apartment	57	55.3	
House or other dwelling	46	44.7	
On campus			
Residence halls	65	72.2	
Other	25	27.8	
Behavioral risk profile			
Smoking (years)	188		8.0/6.7
Daily No. of cigarettes smoked	193		11.4/9.8
Close friends who smoke (No.)	182		4.2/4.0
Roommates who smoke (No.)	160		1.2/1.80

TABLE 1—Continued

Characteristic	<i>n</i> ^a	%	<i>M</i> / <i>SD</i> ^b
Smoking (frequency)			
Every day	133	68.9	
>Once a week	44	22.8	
>Once a month	16	8.3	
Use chewing tobacco or snuff			
No	178	92.2	
Yes	15	7.8	
Smoke a pipe			
No	186	96.4	
Yes	7	3.6	
	Psychographic attributes		
Tried to quit (No. of times)	124		3.0/2.2
Urges and cravings (frequency)			
Never	25	13.0	
Rarely	30	15.5	
Once or twice/month	10	5.2	
Several times/month	5	2.6	
Once or twice/week	18	9.3	
Several times/week	2	1.0	
Once or twice/day	43	22.3	
Several times/day	60	31.1	
Going to try to quit or cut down (interest)			
Very unlikely	47	24.4	
Somewhat unlikely	17	8.8	
Neither unlikely nor likely	11	5.7	
Somewhat likely	46	23.8	
Very likely	72	37.3	
Intend to quit or cut down (intention)			
Very unlikely	49	25.4	
Somewhat unlikely	18	9.3	
Neither unlikely nor likely	13	6.7	
Somewhat likely	47	24.4	
Very likely	66	34.2	

^a Total *n* = 193; however, in a few instances, not all respondents answered each question.

^b *M*, mean; *SD*, standard deviation.

^c One graduate student did not report year in school.

demographic and social role position variables listed in Table 1. Only two differences were noted. Smokers were significantly lower in terms of class rank than nonsmokers, $M = 2.74$, $SD = 1.41$ vs $M = 2.98$, $SD = 1.41$, $t(2947) = 3.20$, $P = 0.001$. Class rank remained significantly different even after subjects in the "other" category (special students who were not part of the traditional freshman through graduate class ranks) were eliminated, $t(2,923) = 2.93$, $P = 0.003$. In addition, relative to nonsmokers, more smokers lived off campus, $\chi^2(1, N = 2,923) = 4.24$, $P = 0.04$. A comparison of smokers in the present study to college

students who participated in a 1990 national survey of young adults (19), however, showed that these two samples were equivalent in prevalence and smoking habit data.⁵

Social role position. Again, most smokers lived off campus, and the majority occupied apartments. Of the smokers who lived on campus, over two-thirds lived in residence halls and the other third lived in married student housing.

Behavioral risk profile. Table 1 summarizes the behavioral risk profile of smokers. On average, students had smoked for more than half a decade and more than two-thirds of them smoked every day. The mean number of cigarettes smoked per day was slightly over half a pack. The vast majority did not smoke a pipe or use other tobacco products such as chewing tobacco or snuff. On average, a student had at least four close friends and one roommate who smoked.

Psychographic attributes. Table 1 also summarizes psychographic characteristics of smoking and quitting. Most smokers experienced urges and cravings once or several times a day. Almost two-thirds had already tried to quit several times, and the majority rated their interest and intention to quit or cut down as "somewhat likely" to "very likely."

Audience Variables with Marketing Mix Implications

Product. Table 2 presents audience variables with implications for product design. About three-fourths of the smokers preferred to attend a program on Monday, Tuesday, or Wednesday, with Tuesday as the most preferred day.⁶ Most indicated that convenient and flexible program hours, friends' participation, and reminders would "sometimes" to "constantly" affect their participation in a smoking cessation program. In addition, most smokers rated lack of motivation as "sometimes" to "constantly" interfering with participation.

Price. Table 3 presents audience variables relevant to the price decision. Nearly half of the smokers earned between \$1,000 and \$4,999 a year. The majority of smokers were willing to pay a program fee; about one-fourth were willing to pay at least \$10 and another fourth were willing to pay up to \$25. In addition, four-fifths of the smokers were willing to pay a refundable deposit for participation but slightly less than two-thirds preferred that it be \$25 or less. The amount of money that students were willing to spend might be explained, at least partially, by the small, although significant, correlation between willingness to pay a program fee and their annual income, $r(183) = 0.21$, $P = 0.002$.

Place. Table 4 presents variables relevant to the place (location) decision. About half of the students typically used a car and the other half indicated that walking or bicycling was their main means of transportation. Over two-thirds of the students indicated that they would be willing to travel no more than 3 miles to

⁵ Two-thirds of the sample were between 18 and 22 years old (see age variable in Table 1). Prevalence rates for smoking every day and smoking half a pack or more per day were 12.4 and 7.5%, respectively.

⁶ This preference does not appear to be a function of differential work load due to class scheduling. On this campus, course offerings are spread equally across each day of the week according to data from the Office of Space Management and Academic Scheduling.

TABLE 2
DESCRIPTIVE STATISTICS OF AUDIENCE VARIABLES WITH IMPLICATIONS FOR PRODUCT DESIGN

Variable	n ^a	%
Health program convenience		
Monday	38	21.0
Tuesday	55	30.4
Wednesday	44	24.3
Thursday	18	9.9
Friday	11	6.1
Saturday	9	5.0
Sunday	6	3.3
Hours convenient and flexible		
Never affect participation	36	18.7
Infrequently affect participation	38	19.7
Sometimes affect participation	57	29.5
Often affect participation	43	22.2
Constantly affect participation	19	9.9
Friends participate in program		
Never affect participation	30	15.5
Infrequently affect participation	24	12.4
Sometimes affect participation	61	31.6
Often affect participation	56	29.0
Constantly affect participation	22	11.4
Reminders help participation		
Never affect participation	33	17.1
Infrequently affect participation	26	13.5
Sometimes affect participation	62	32.1
Often affect participation	51	26.4
Constantly affect participation	21	10.9
Lack of motivation		
Never interfere w/participation	29	15.0
Very infrequently interfere	34	17.6
Sometimes interfere	61	31.6
Often interfere	48	24.9
Constantly interfere	21	10.9

^a Total n = 193; however, not all respondents answered each question.

attend a program. Convenient location was expected to affect participation "often" to "constantly" by the majority of students. Four-fifths of the smokers also indicated that insufficient time would "sometimes" to "constantly" affect their participation.

Promotion. Table 5 presents variables with implications for promotion strategies. The media source rated as most preferred for learning about the program was the university newspaper; bulletin boards were the second choice. Pamphlets and announcements in class were preferred about equally but to a lesser extent than the campus newspaper. About half of the students bought cigarettes at grocery stores or gas stations. The highest percentage of students indicated that a refund of program fees was the best incentive to increase participation in a smoking cessation program.

TABLE 3
DESCRIPTIVE STATISTICS OF AUDIENCE VARIABLES WITH IMPLICATIONS FOR PRICING

Variable	<i>n</i> ^a	%
Yearly income (\$)		
0	18	9.8
1-999	16	8.7
1,000-2,999	54	29.4
3,000-4,999	37	20.1
5,000-6,999	23	12.5
7,000-8,999	10	5.4
9,000-11,999	12	6.5
12,000-15,999	6	3.3
16,000-19,999	2	1.1
20,000-24,999	1	.5
Over 25,000	5	2.7
Willing to pay program fee (\$)		
0	82	42.5
Up to 10	51	26.4
Up to 25	47	24.4
Up to 50	12	6.2
More than 50	1	.5
Willing to pay refundable deposit (\$)		
0	37	19.2
Up to 10	55	28.5
Up to 25	57	29.5
Up to 50	29	15.0
More than 50	15	7.8

^a Total *n* = 193; however, not all respondents answered each question.

DISCUSSION

This study identifies prepromotional and preproduction variables relevant to participant recruitment and design of a smoking cessation campaign for university students based on social marketing principles (9-16). Demographic audience segmentation characteristics and information about social role position indicate that the target audience is predominantly single, unmarried, childless, white, full-time students who are lower classmen in their early 20s. Their behavioral risk profile indicates that the tobacco-use habits of the students who smoked are moderate but well established and confined almost exclusively to cigarette smoking. Based on psychographic data, these smokers are interested in quitting or cutting down and intend to do so even though they have been unsuccessful in the past.

Analyses of the audience data indicate that accessibility and affordability are the main factors to consider in designing a program for university smokers. Convenience, flexibility, social support, behavioral prompts/cues, low-demand interventions, and programs offered early in the week (preferably on Tuesdays) are also important program design factors.

The data suggest several other specific recommendations pertaining to the design and implementation of smoking cessation programs. Smokers may be attracted to programs that include friends in treatment because respondents gener-

TABLE 4
DESCRIPTIVE STATISTICS OF AUDIENCE VARIABLES WITH IMPLICATIONS FOR PLACE
(LOCATION) DECISIONS

Variable	<i>n</i> ^a	%
Transportation use		
Car	96	49.7
Taxi	0	0.0
City bus	0	0.0
Bicycle	3	1.6
Walk	94	48.7
Furthest distance willing to travel		
1-3 Miles	131	68.9
4-8 Miles	31	16.3
10-20 Miles	25	13.2
>30 Miles	3	1.6
Convenient location		
Never affect participation	28	14.5
Infrequently affect participation	13	6.7
Sometimes affect participation	46	23.8
Often affect participation	73	37.8
Constantly affect participation	33	17.2
Do not have extra time		
Never affect participation	16	8.3
Infrequently affect participation	22	11.4
Sometimes affect participation	70	36.3
Often affect participation	60	31.0
Constantly affect participation	25	13.0

^a Total *n* = 193; however, not all respondents answered each question.

ally had friends and roommates who smoked. Attending with friends may also sustain motivation because the person feels accountable to others for his or her behavior. Written program reminders are relatively inexpensive and also may increase participation. The location and day of the week the program is offered may decrease time constraints, which were reported by university smokers as a potentially limiting factor. One possible method of creating accessibility would be to provide several satellite programs on campus and at other strategic "population centers" where smokers gather.

Other factors also should be considered in program design. The target audience may be relatively resistant to smoking cessation (7, 20) but multiple opportunities exist to intervene. Smokers are predominantly lower classmen, and only 15% of college students nationally graduate within 4 years; less than half complete a bachelor's degree after 6 years (21). Given students' preferences for flexible scheduling and low-demand interventions, a service delivery strategy that might be successful with student smokers and could be used longitudinally is the *Stepped Approach Model* (SAM, 22-25). This model advocates that programs be introduced in graded sequence from least to most intensive. Therefore, university smokers would enroll in the simplest, least expensive program first and would attend more demanding programs only if they were unsuccessful at smoking ces-

TABLE 5
DESCRIPTIVE STATISTICS OF AUDIENCE VARIABLES WITH IMPLICATIONS FOR
PROMOTION DECISIONS

Variable	<i>n</i> ^a	%
Media use^b		
University newspaper	116	37.1
Bulletin boards	70	22.4
Announcements in classes	51	16.3
University pamphlets	45	14.4
Radio	19	6.0
Television	12	3.8
Cigarette purchases		
Gas station	45	23.3
Grocery store	48	24.9
Drug store	30	15.5
Convenience store	36	18.7
Vending machine	13	6.7
News stand	0	0.0
Other smokers	12	6.2
Other	9	4.7
Incentives to increase participation		
Nothing	68	35.2
Refund of program fees	81	42.0
Prizes	22	11.4
Free food coupons	22	11.4

^a Total *n* = 193.

^b This is a multiple response item.

sation. Multiple attempts to quit also may result in "cumulative therapeutic effects," influence "readiness to change" or a willingness or preparedness to quit smoking, and end in success where single attempts may fail (26, 27).

In addition, the results of this study have important implications for recruitment and for developing campaign messages and program announcements. The data indicate that it would be prudent to advertise in the campus newspaper the announcement of a smoking cessation program. Another way to advertise might be in nearby grocery stores and gas stations where students purchase cigarettes. Important to consider in developing an advertisement are behavioral risk profile factors including habit strength of tobacco use, demographic factors, and specific preferences regarding program features identified in this study.

CONCLUSION

In summary, this study serves as a first initiative to develop specific recruitment and program design strategies for reducing cigarette smoking among university students. Recruitment can be enhanced by announcements and advertisements that target both men and women in their early twenties who are lower classmen, white, single, and U.S. citizens. Announcements and advertisements should appear in publications with high college readership and/or in locations associated with tobacco purchase. Program design considerations include accessibility and

affordability of programs along with convenience, flexibility, social support, and behavioral prompts/cues. These suggestions based on social marketing framework provide useful information for the development of comprehensive smoking cessation programs for university populations.

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REFERENCES

1. Johnston LD, O'Malley PM, Bachman JG. National Trends in Drug Use and Related Factors among American High School Students and Young Adults, 1975-1986. Rockville, MD: National Institute on Drug Abuse.
2. U.S. Department of Commerce. Statistical Abstract of the United States, 110th ed. Washington, DC: U.S. Government Printing Office.
3. U.S. Department of Health and Human Services. Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Surgeon General. DHHS Publication No. (CDC) 89-8411. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1989.
4. Orleans CT, Schoenback VJ, Salmon MA, Strecher VJ, Kalsbeek W, Quade D, Brooks EF, Konrad TR, Blackmon C, Watts CD. A survey of smoking and quitting patterns among black Americans. *Am J Public Health* 1989; 79:176-181.
5. Manley M. Smoke damage: The health effects of tobacco. *Multinational Monitor* 1987; July/August:22.
6. U.S. Department of Health and Human Services. Healthy People 2000: National Health Promotion and Disease Prevention Objectives. Boston: Jones and Bartlett, 1992.
7. Pierce JP, Naquin M, Gilpin E, Giovino G, Mills S, Marcus S. Smoking initiation in the United States: A role for worksite and college smoking bans. *JNCI* 1991; 83:1009-1013.
8. American Cancer Society. Cancer Facts & Figures—1991. Atlanta, GA: National Headquarters, American Cancer Society, Inc., 1991.
9. Atkin CK, Freimuth V. Formative evaluation research in campaign design. In: Rice RE, Atkin CK, Eds. *Public Communication Campaigns*, 2nd ed. Newbury Park, CA: Sage, 1989:131-150.
10. Alexander K, McCullough J. Application of social marketing principles to improve participation in public health programs. *J Community Health* 1981; 6:216-222.
11. Black DR, Hultsman JT. The Purdue stepped approach model: Sequencing community and clinical interventions to reduce cardiovascular risk factors. *Int Q Community Health Edu* 1989; 10:19-37.
12. Kotler P, Zaltman G. Social marketing: An approach to planned social change. *J Marketing* 1971; 35:3-12.
13. Kotler P. *Marketing Management: Analysis, Planning, Implementation, and Control*. 7th ed. Englewood Cliffs, NJ: Prentice-Hall, 1991.
14. Solomon DS. A social marketing perspective on communication campaigns. In: Rice RE, Atkin CK, Eds. *Public Communication Campaigns*, 2nd ed. Newbury Park, CA: Sage, 1989:87-104.
15. Kotler P, Roberto E. *Social Marketing: Strategies for Changing Public Behavior*. New York, NY: Free Press, 1990.
16. Fine SH. *Social Marketing: Promoting the Causes of Public and Nonprofit Agencies*. Boston, MA: Allyn and Bacon, 1990.
17. O'Keefe M. What ever happened to the crash of '80 '81 '82 '83 '84 '85? *Change* 1985; 17(3):37-41.
18. State University of New York. Age Group and Sex of Students. Report No. 8-89. (ERIC No. ED318358). Albany, NY: Central Staff Office of Institutional Research.

19. Johnston LD, O'Malley PM, Bachman JG. *Smoking, Drinking, and Illicit Drug Use Among Secondary Students, College Students, and Young Adults, 1975-1991, Volume II, College Students and Young Adults*. DHHS Publication No. (ADM) 92-1940. Washington, DC: U.S. Department of Health and Human Services. Public Health Service. Alcohol, Drug Abuse, and Mental Health Administration. 1991.
20. Fiore MC, Novotny TE, Pierce JP, Giovino GA, Hatzianandreu EJ, Newcomb PA, Surawicz TS, Davis RM. Methods used to quit smoking in the United States: Do cessation programs help? *JAMA* 1990; 263:2760-2765.
21. Wilson R. Only 15% of students graduate in 4 years, a new study finds. *Chron Higher Educ* 1990; 36(23):A1, A42.
22. Babrow AS, Black DR, Tiffany ST. Beliefs, attitudes, intentions, and a smoking cessation program: A planned behavior analysis of communication campaign development. *Health Commun* 1990; 2:145-163.
23. Black DR, Loughead TA, Hadsall RS. Purdue stepped approach model: Application to pharmacy practice. *Drug Intell Clin Pharm* 1991; 25:164-168.
24. Black DR, Hultsman JT. The Purdue stepped approach model: A heuristic application to health counseling. *The Couns Psychol* 1988; 16:647-667.
25. Black DR, Babrow AS. Identification of campaign recruitment strategies for a stepped smoking cessation intervention for a college campus. *Health Educ Q* 1991; 18:235-247.
26. Prochaska JO, DiClemente CC. Toward a comprehensive model of change. In: Miller HR, Heather N, Eds. *Treating Addictive Behaviors: Processes of Change*. New York: Plenum, 1986:3-27.
27. Schachter S. Recidivism and self-cure of smoking and obesity. *Am Psychol* 1982; 37:436-444.

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