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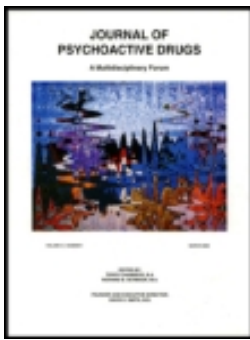
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National Age and Sex Differences in Quitting Smoking[†]

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Abstract—The 1986 Adult Use of Tobacco Survey conducted by the Office on Smoking and Health of the Centers for Disease Control asked detailed questions on smoking behavior from a representative sample of 13,031 Americans. Using a smoking continuum developed from that survey as an index, it was postulated that a hard-core group of smokers would be overrepresented in some categories of this continuum in certain groups of the population. In this survey, more women than men who had quit in the preceding year had relapsed to smoking by the time of the survey. However, the fact that similar proportions of men and women had quit smoking for between one and five years suggested that the difference might not have involved the proportion who relapsed but only the timing of that relapse. Smokers over the age of 65 are more likely both to attempt to quit and to continue abstaining than those between ages 25 and 64. Results from this survey do not indicate a major group of smokers who either resist change or who feel unable to quit successfully.

Keywords—age, sex, smoking behavior, smoking cessation, smoking continuum

Cigarette smoking has long been identified as one of the most significant causes of death in the United States. Smoking is responsible for an estimated 30% of all cancer deaths (including 87% of all deaths from lung cancer), 21% of all deaths from coronary heart disease, 18% of all deaths from stroke, and 82% of all deaths from chronic obstructive pulmonary disease. In total, one-sixth of all deaths in the U.S. (approximately 390,000 in 1985) are smoking related (U.S. Department of Health and Human Services 1989).

Since 1964, the year of publication of the first Surgeon General's report on the health consequences of smoking (U.S. Department of Health, Education and Welfare 1964), there has been a considerable public health effort to reduce the prevalence of smoking among U.S. adults. This figure, which was 40% in 1965, has since declined at a consistent rate of 0.5 percentage points per year to a prevalence of 29% in 1987 (U.S. Department of Health and Human Services 1989). The best estimate of the prevalence of smoking in the year 2000 is 22% (Pierce et al. 1989b), unless there is a major change in the effectiveness of the country's prevention and cessation activities.

The present article looks at the recent history of smoking cessation. With cigarette smoking, as with other addictive substances, the user's behavior is largely controlled by the psychoactive substance; in this case, nicotine (U.S. Department of Health and Human Services 1988a). Because nicotine is physically addictive, sudden abstinence is ac-

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accompanied by a withdrawal syndrome. As a result, users attempting to quit tend to relapse. Therefore, smoking cessation must be viewed as a dynamic process where the goal can only be said to have been obtained when a person has been abstinent for a significant period of time. The study of community cessation experience, then, must necessarily be the study of a time-dependent variable. However, most reports relating to cessation either deal with the proportion of former smokers who comprise the study population of "ever smokers" (the quit ratio) (Fiore et al. 1989; Pierce et al. 1989a, 1987a) or, less appropriately, they deal with only the number of former smokers in the population (U.S. Department of Health, Education and Welfare 1979).

An index of smoking cessation was defined, the smoking continuum, which included information on the recency of attempts to quit among current smokers as well as on the duration of these attempts. For former smokers the duration of abstinence is included. This index allowed a comparison of three groups: two of which came from those who had never tried to quit over the preceding year, and one from those who had made the more successful attempts to quit. Finally, it allowed an examination of recent successes within different population groups, without being encumbered with the cumulative effect of those who successfully quit smoking many years ago.

Such analyses are critical to understanding the dynamics of community cessation. Age and sex differences are reported in these categories. Finally, because the intention to quit smoking is associated with future quitting (Pierce et al. 1987b), the distribution of the intention level of the smoking continuum is reported and thus gives an indication of possible trends across the continuum.

Historically, women, as a group, started to smoke later than men and, on the average, have always consumed fewer cigarettes per day than men (U.S. Department of Health and Human Services 1980). However, with each successive birth cohort, male and female smoking characteristics have become increasingly similar. By the late 1970s, approximately one-third of smokers from both sexes reported trying to quit in the previous year (U.S. Department of Health and Human Services 1980). Despite these findings, there is still a pervasive feeling among some smoking cessation treatment practitioners that more men are quitting than women and that they are having an easier time of quitting.

Smoking cessation was one of the specific topics addressed at the Surgeon General's Workshop on Health Promotion and the Elderly (U.S. Department of Health and Human Services 1988b). At this workshop, it was assumed that older people have lengthy histories of nicotine addiction, unsuccessful quit attempts, and physiological, psychological, and situational dependencies on smoking. By the very nature of the duration of and cumulative exposure to smoking among older people, the workshop argued that

older smokers are more likely to be hard-core smokers and may present the most significant challenges to smoking cessation efforts in the future.

An important preliminary question in this presumed association between age and smoking is whether or not there *are* any hard-core smokers. If there is a group of smokers who are completely resistant to the message to stop smoking, one would expect to find them among older persons who had never tried to quit and who had expressed no intention of ever quitting. Another representative group of hard-core smokers would include those who, having previously failed to quit, no longer feel that they can succeed in quitting. It was expected that this hypothetical group would be found among older persons who had previously tried to quit but had not tried in the preceding year.

METHODS

The 1986 Adult Use of Tobacco Survey was a telephone interview survey of 13,031 members of the civilian, noninstitutionalized population of the United States. Conducted for the Office on Smoking and Health, Centers for Disease Control by Westat Inc., the survey used random digit dialing techniques. The complex sampling process used to ensure oversampling of "ever smokers" as well as representatives of the population has been described elsewhere (U.S. Department of Health and Human Services, *In press*). The response rate to the survey was 74.3%. The data were weighted to control for oversampling design and to adequately represent the population according to geographic region, educational level, racial origin, sex, and age.

Current and former smokers were defined from questions on whether or not the respondent had smoked at least 100 cigarettes in his or her lifetime, and on whether or not the respondent was presently smoking. Smoking cessation histories were obtained by asking former smokers when they had stopped smoking and by asking current smokers if they had ever made a serious attempt to stop, when the last such attempt began, and how long it lasted. If they had never made a serious quit attempt, they were asked whether or not they had ever thought about making one and would they quit if there were an easy way to do it. All ever smokers were asked to indicate whether or not they thought they would be smoking in five years.

These smoking questions were used to define an ordinal index of smoking that was called the smoking continuum. This continuum contains the following 10 categories:

1. Current smokers who have never tried to quit and never thought about quitting.
2. Current smokers who had never tried to quit but had thought about it and said they would quit if there was an easy way to do it.
3. Current smokers who had quit previously, but not in

TABLE I
THE SMOKING CONTINUUM BY SEX

Smoking Continuum	Men (%)	Women (%)
Smoker, never thought about trying to quit	8.3	9.1
Smoker, never quit but would if it were easy	9.1	9.6
Smoker, previously quit but not in preceding year	21.5	23.9
Smoker, relapsed in preceding year	10.1	13.2
Ex-smoker, quit in preceding year	10.4	9.5
Ex-smoker, quit one to five years	10.9	10.7
Ex-smoker, quit five or more years	30.1	25.1
Ever smoker who smoked during preceding year	59.4	65.3
Preceding year's smoker who quit during preceding year	34.5	34.7
Preceding year's quitter still off cigarettes at survey	50.7	41.8

the past year.

4. Current smokers who had quit for one to six days in the past year.
5. Current smokers who had quit for seven days or more in the past year.
6. Former smokers who had quit within the past three months.
7. Former smokers who had been quit from three to 12 months.
8. Former smokers who had been quit from one to five years.
9. Former smokers who had quit over five years ago.
10. Never smokers.

In some sections of the present article, never smokers have been deleted and only ever smokers are considered.

FINDINGS

The Influence of Sex on Quitting

Thirty percent of men and 25% of women who had ever smoked had quit smoking for longer than five years (see Table I). Another 11% of each sex had been off cigarettes for

between one and five years, whereas 10% were former smokers who had quit in the past year. Approximately 18% of ever smokers from both sexes had never tried to quit, with approximately equal proportions of these divided between those who have never thought about trying to quit or would have tried if there had been an easy way to quit. Almost a quarter of ever smokers of both sexes had previously quit smoking but did not do so in the preceding year. Thirty-four percent of both men and women who smoked in the preceding year had tried to quit. However, of those who had tried, only 50.7% of men and 41.8% of women were still not smoking at the time of the survey.

The Influence of Age on Quitting

As expected, there was a marked increase across ages in the proportion of ever smokers who had quit for five or more years (see Table II). Although half of the ever smokers over the age of 65 were in this category, this finding needs to be tempered by the knowledge that the markedly higher mortality rate for smokers in this age group would tend to inflate this proportion. At the other end of the continuum, there was little difference across the ages in the proportion

TABLE II
THE SMOKING CONTINUUM BY AGE

Smoking Continuum	Age			
	18-24 (%)	25-44 (%)	45-64 (%)	65+ (%)
Smoker, never thought about trying to quit	9.1	6.9	8.3	7.4
Smoker, never quit but would if it were easy	18.4	10.6	7.5	3.6
Smoker, previously quit but not in preceding year	16.3	26.4	21.6	14.5
Smoker, relapsed in preceding year	26.5	13.0	7.9	4.1
Ex-smoker, quit in preceding year	16.2	10.1	9.4	10.7
Ex-smoker, quit one to five years	10.3	11.4	9.9	10.1
Ex-smoker, quit five or more years	3.0	20.6	35.6	40.7
Ever smoker who smoked during preceding year	86.3	68.0	54.5	30.2
Preceding year's smoker who quit during preceding year	49.5	34.0	31.7	49.0
Preceding year's quitter still off cigarettes at survey	38.0	43.7	54.3	72.3

of those who had never thought about trying to quit—proportions varied between 7% and 9%. The fact that this category comprised as many older as it did younger people may have indicated a hard-core group of smokers who are resistant to quitting.

However, the proportion of those who would have quit had there been an easy way to do it showed a marked gradient with age: Over 18% of younger ever smokers and less than 4% of older smokers were in this category. Moreover, compared with younger age groups, a much smaller proportion of persons over age 65 was among those ever smokers who had previously quit but had not done so in the preceding year. Thus, in both categories of the continuum in which one might have expected to find hard-core smokers who were unable to quit after repeated attempts, there were markedly lower proportions of ever smokers over the age of 65 years.

Another major question regarding smoking cessation and age is whether or not older smokers are still quitting.

The study found that of those people who had smoked in the preceding year the proportion who had quit during that year varied with age. Almost half of those in the youngest and the oldest age categories tried to quit during the year, whereas only a third of the middle two age categories did so. Notably, of those who had made an attempt, the proportion who were still not smoking at the time of the survey showed a strong gradient by age, from a low of 38% in the youngest age group to a high of 72% in the over-65 age group. Thus, by the age of 65 over two-thirds of the people who had smoked had been quit for longer than a year; and half of those who were still smoking had tried to quit during the preceding year.

Intention to Smoke by the Quitting Continuum

Over 90% of ever smokers who had quit smoking for over five years indicated that they would definitely not be smoking five years hence (see Table III). The only thing surprising about this figure was that it was not higher.

TABLE III
INTENTION TO SMOKE IN FIVE YEARS BY SMOKING CONTINUUM

Smoking Continuum	Will Not (%)	Probably Not (%)	Probably Will (%)	Will (%)
Smoker, never thought about trying to quit	3.7	16.4	61.1	18.7
Smoker, never quit but would if it was easy	11.3	38.5	47.6	2.4
Smoker, previously quit but not in preceding year	14.0	38.6	42.1	5.4
Smoker relapsed in preceding year	19.8	44.3	33.6	2.3
Ex-smoker quit in preceding year	65.4	28.0	5.7	0.8
Ex-smoker, quit one to five years	77.2	19.9	2.5	0.3
Ex-smoker, quit five or more years	92.5	5.3	1.8	0.3
Total	48.0	24.7	23.8	3.5

Indeed, 2% of these former smokers indicated that they might return to smoking.

The other notable category in the table concerned those smokers who had never thought about quitting. Even among this group, only 19% were "convinced" that they would still be smoking in five years; 20% felt that they might not be smoking. These results suggested that even this group of smokers might not represent hard-core smokers resistant to quitting. Among those current smokers who had never tried to quit, but said they would quit if there was an easy way to do so, less than 3% were "convinced" that they would be smoking in five years, and only 50% felt that they "might" be smoking. Overall, very few ever smokers felt that they would definitely be smoking five years hence and the majority felt that they would not be smoking at that time.

DISCUSSION

Using the smoking continuum rather than a point prevalence measure of smoking permitted a much more detailed analysis, particularly of quitting behavior. Like the

quitting process itself, this continuum is a time-dependent measure; hence it is also an appropriate measure of smoking behavior. Using this continuum, age and sex differences were examined in recent quitting behavior for those whose last attempt had been successful as well as for those who had failed. Smokers who had made a recent attempt to quit were also considered, because it was felt that this group would include people who had previously tried to quit many times and had now given up the effort.

The major differences for sexes in the smoking continuum occurred among the long-term former smokers, where there were 20% more men than women. This difference reflects the fact that smoking behavior peaked earlier among men than it did among women (U.S. Department of Health and Human Services 1980). Because this category is open-ended, there is a cumulative effect over time; hence, men are expected to have higher representation in this group. More significantly, the same proportion (34%) of men and women who had smoked during the preceding year had made a serious attempt to quit. However, many fewer women than men in this group were still not smoking at the time of the survey.

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