

Georgia State University ScholarWorks @ Georgia State University

Public Health Faculty Publications

School of Public Health

1996

Attitudes, Knowledge, and Beliefs About Low-Yield Cigarettes Among Adolescents and Adults

Gary A. Giovino

University at Buffalo, ggiovino@buffalo.edu

Scott Tomar

University of Florida, stomar@dental.ufl.edu

Murli N. Reddy

John P. Peddicord

Bao-Ping Zhu

See next page for additional authors

Follow this and additional works at: https://scholarworks.gsu.edu/iph_facpub

 Part of the [Public Health Commons](#)

Recommended Citation

Giovino, G.A., Tomar, S.L., Reddy, M.N., Peddicord, J.P., Zhu, B.P., Escobedo, L.G., and Eriksen, M.P. (1996). Attitudes, knowledge, and beliefs about low-yield cigarettes among adolescents and adults. Smoking and Tobacco Control Monograph No 7. The FTC Cigarette Test Method for determining Tar, Nicotine, and Carbon Monoxide Yields of U.S. Cigarettes, Report of the NCI Expert Committee. 39-57. Bethesda, MD: National Cancer Institute.

This Article is brought to you for free and open access by the School of Public Health at ScholarWorks @ Georgia State University. It has been accepted for inclusion in Public Health Faculty Publications by an authorized administrator of ScholarWorks @ Georgia State University. For more information, please contact scholarworks@gsu.edu.

Authors

Gary A. Giovino, Scott Tomar, Murli N. Reddy, John P. Peddicord, Bao-Ping Zhu, Luis G. Escobedo, and Michael Eriksen

Attitudes, Knowledge, and Beliefs About Low-Yield Cigarettes Among Adolescents and Adults

Gary A. Giovino, Scott L. Tomar, Murli N. Reddy, John P. Peddicord, Bao-Ping Zhu, Luis G. Escobedo, and Michael P. Eriksen

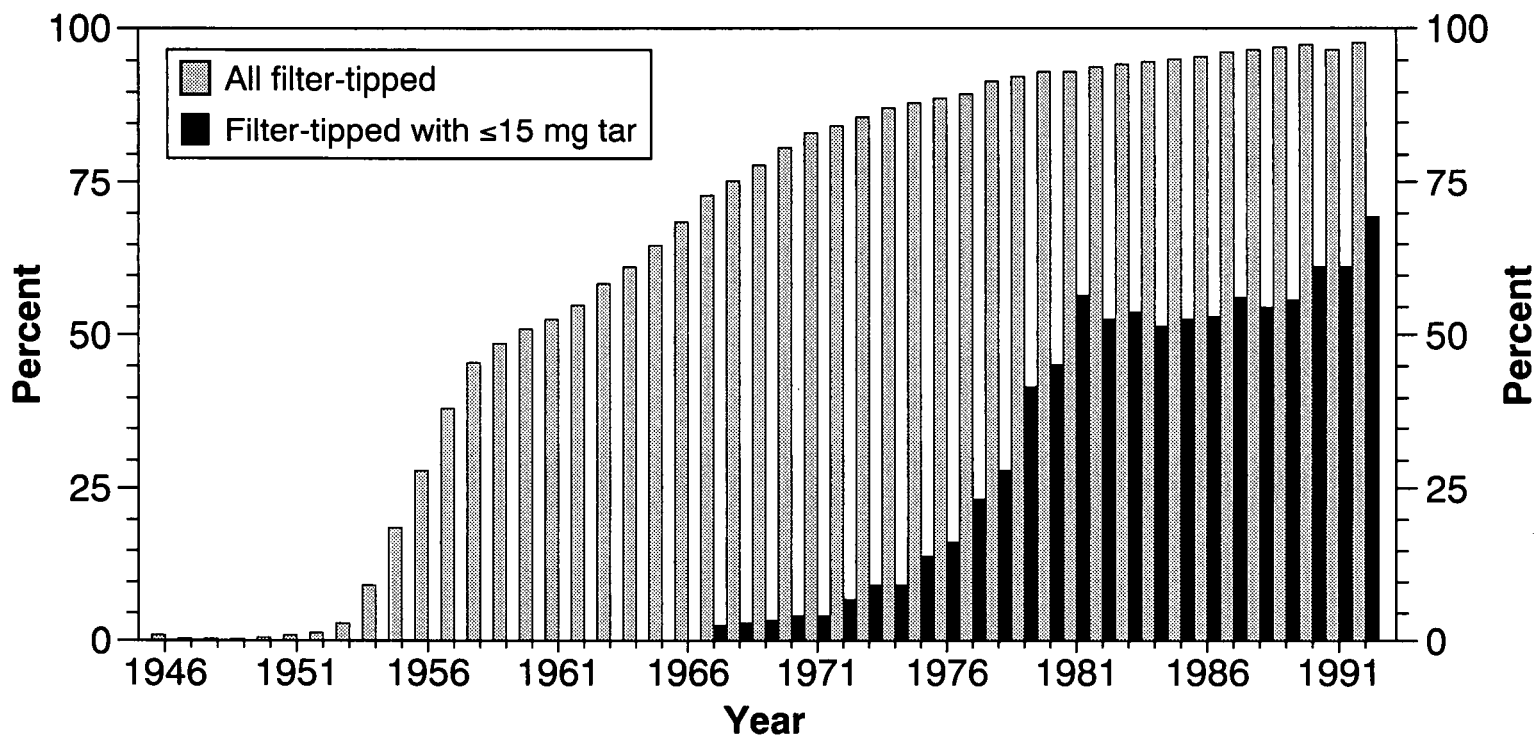
INTRODUCTION Per capita consumption of cigarettes in the United States increased rapidly from 1900 to 1963 (Miller, 1981; U.S. Department of Health and Human Services, 1989); however, since the January 1964 release of the first Surgeon General's report on smoking (U.S. Department of Health, Education, and Welfare, 1964), cigarette consumption has been declining (Miller, 1981; U.S. Department of Agriculture, 1987 and 1994). In 1994 per capita consumption was about the same as during World War II (Miller, 1981; U.S. Department of Agriculture, 1994). However, the prevalence of smoking was slightly higher in the 1940's (Centers for Disease Control and Prevention, 1994a; U.S. Department of Health and Human Services, 1988), indicating that smokers in the 1990's consumed more cigarettes per day than did smokers in the 1940's (Harris, 1994; U.S. Department of Health and Human Services, 1980).

Falls in per capita consumption of cigarettes seem linked to health concerns. For example, in the early 1950's, scientific and popular articles led to increasing concern about smoking-related cancers. American and British studies provided a scientific foundation for the mounting health concerns (Doll and Hill, 1950 and 1952; Levin et al., 1950; Wynder and Graham, 1950). Articles such as "Cancer by the Carton," published in the *Reader's Digest* (Norr, 1952), also carried the message to many people (U.S. Department of Health and Human Services, 1989).

One apparent result of these early health communications was the marked increase in the consumption of filter-tipped cigarettes. In the 1940's few people smoked those varieties (U.S. Department of Agriculture, 1962), but by 1992 about 97 percent of cigarettes sold had filters (Figure 1) (Federal Trade Commission, 1994). Switching to filtered cigarettes was promoted by slogans such as "Kent with the micronite filter is smoked by more scientists and educators than any other cigarette" (Anonymous, 1985).

The release of the first Surgeon General's report on smoking was a major turning point in public perception of the health threat of tobacco (U.S. Department of Health, Education, and Welfare, 1964; U.S. Department of Health and Human Services, 1989). In response, cigarette companies began introducing cigarettes in the 1960's and early 1970's that yielded,

Figure 1
Domestic market share of all filter-tipped cigarettes and those filter-tipped cigarettes yielding ≤ 15 mg tar: United States, 1946-1992



Sources: U.S. Department of Agriculture, 1962; Federal Trade Commission, 1994.

by the Federal Trade Commission (FTC) method (Pillsbury et al., 1969), 15 mg or less tar (Federal Trade Commission, 1994; Slade, 1989; Warner, 1985). By 1992 these so-called milder cigarettes had captured about 69 percent of the market (Federal Trade Commission, 1994).

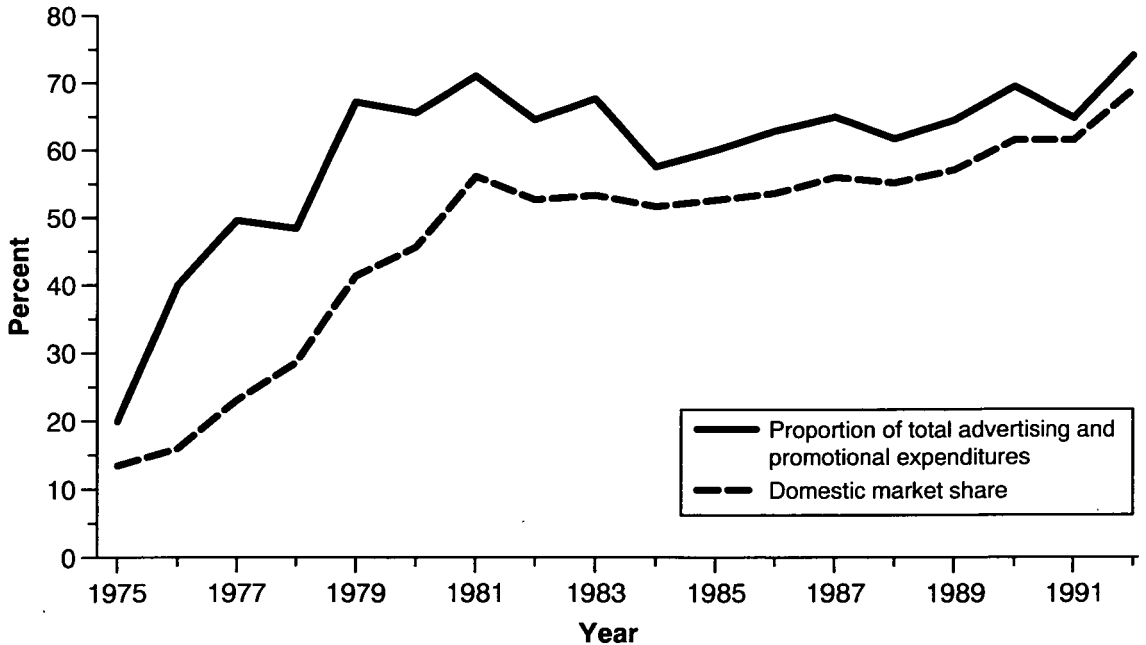
The lower tar cigarettes were accompanied by advertisements such as the following:

Vantage is changing a lot of my feelings about smoking. I like to smoke, and what I like is a cigarette that is not limited on taste. But I am not living in an ivory tower. I hear the things being said about high tar smoking as well as the next guy. So, I started looking for a low tar smoke that had some honest-to-goodness taste (Anonymous, 1977).

It is believed that the Vantage advertisements targeted "intelligent" smokers (Pollay, 1990).

Since 1974, FTC has collected data on advertising and promotion of cigarettes yielding 15 mg or less tar (Figure 2) (Federal Trade Commission, 1994). As pointed out by Davis (1987), for many years the proportion of advertising and promotional expenditures for lower tar cigarettes exceeded

Figure 2
Domestic market share and proportion of total advertising and promotional expenditures related to cigarettes yielding ≤ 15 mg tar, by year: United States, 1975-1992



Source: Federal Trade Commission, 1994.

market share, suggesting an attempt to increase market share. As shown in Figure 2, the two proportions are converging. In 1992 lower tar cigarettes accounted for 69 percent of market share and 71 percent of advertising expenditures (Federal Trade Commission, 1994).

One major purpose of the marketing of these varieties of cigarettes appears to have been to alleviate smokers' health concerns (Pollay, 1990; Warner 1985). The advertisements seem to have achieved a large part of their goal. In 1993 a Gallup Organization poll posed the following question: "Besides selling the product, what message do you think cigarette advertising is trying to get across when it uses terms like low tar, low nicotine, or low yield?" (Gallup Organization, Inc., 1993, pp. 22). Fifty-eight percent of respondents (56 percent of smokers and 60 percent of nonsmokers) answered that the message indicates a positive health benefit, that is, that the brand is safer, healthier, less harmful, not as bad for you, or less cancerous (Gallup Organization, Inc., 1993).

**MONITORING
NATIONAL DATA**

Three national surveys helped shed light on the patterns in attitudes, knowledge, and beliefs about low-yield cigarettes: the 1986 Adult Use of Tobacco Survey (AUTS), the 1987 National Health Interview Survey (NHIS) Cancer Control Supplement, and the 1993 Teenage Attitudes and Practices Survey (TAPS). The 1986 AUTS was a national telephone survey of approximately 13,000 Americans ages 17 years and older (Pierce et al., 1990). The nationally representative sample of the 1987 NHIS included about 22,000 Americans ages 18 years and older who were interviewed primarily in their homes (Schoenborn and Boyd, 1989). The 1993 TAPS sample included about 13,000 people 10 to 22 years of age who were contacted via telephone or in their homes (Centers for Disease Control and Prevention, 1994b). The 1993 TAPS included a cross-sectional component of persons 10 to 15 years of age in 1993 and a followup component of a cohort of persons first interviewed in 1989 who were 15 to 22 years old in 1993 (Centers for Disease Control and Prevention, 1994b).

There are difficulties in using the 1993 TAPS data to make prevalence estimates. Some participants lost to followup were more likely to be smokers in 1989, a phenomenon that would be likely to decrease the overall prevalence estimate (Centers for Disease Control and Prevention, 1994b). The data used for this report are not used to generate smoking prevalence estimates; rather, they look at characteristics of persons who reported that they were currently smoking.

The 1986 AUTS and the 1987 NHIS questions used to determine tar levels assessed items such as brand name, filter vs. nonfilter, pack hardness, cigarette length, mentholation, and if the cigarette was regular, light, or ultralight. The tar level assigned is based on responses to the questions using FTC tables (Federal Trade Commission, 1985). The tar categories used for this report are (1) less than or equal to 6 mg, (2) 7 to 15 mg, and (3) 16 mg or more. (The actual cutpoints used here are 6.99 mg and 15.99 mg.)

SURVEY FINDINGS

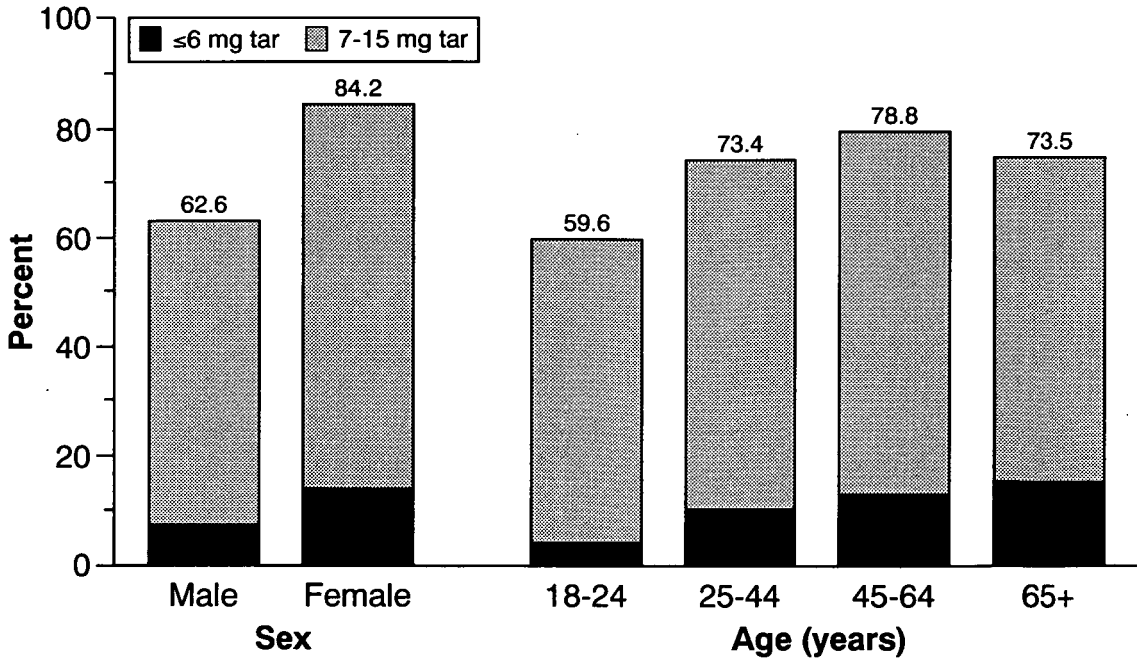
Use of Low-Tar or Light Cigarettes

The percentage distribution of tar yield of the usual brand of cigarettes smoked among current smokers by sex and age is shown in Figure 3. Female smokers were more likely to smoke lower tar yield brands than men. Smokers 18 to 24 years of age were less likely to use the lower tar brands than smokers ages 25 to 44 or 45 to 64. These patterns were similar to those found by the AUTS for both current and former smokers.

With regard to race and ethnicity (Figure 4), white Americans who smoked in 1987 were more likely to smoke lower tar and nicotine cigarettes (76.8 percent) than Hispanics (67.8 percent) or black Americans (52.4 percent). Education is a strong correlate of smoking cigarette brands with 15 mg or less tar (Figure 4). Beginning with persons who have completed 9 to 11 years of education, as education increased, smokers were more likely to smoke low-tar brands.

In the 1993 TAPS, adolescents and young adults who smoked and usually bought their own cigarettes were asked what brands they smoked. Furthermore, they were asked, "Is the brand you smoke regular, light, or

Figure 3
Prevalence (by percent) of current smokers' use of cigarette brands^a with ≤15 mg tar, by sex and age: Ages 18 and older, United States, 1987

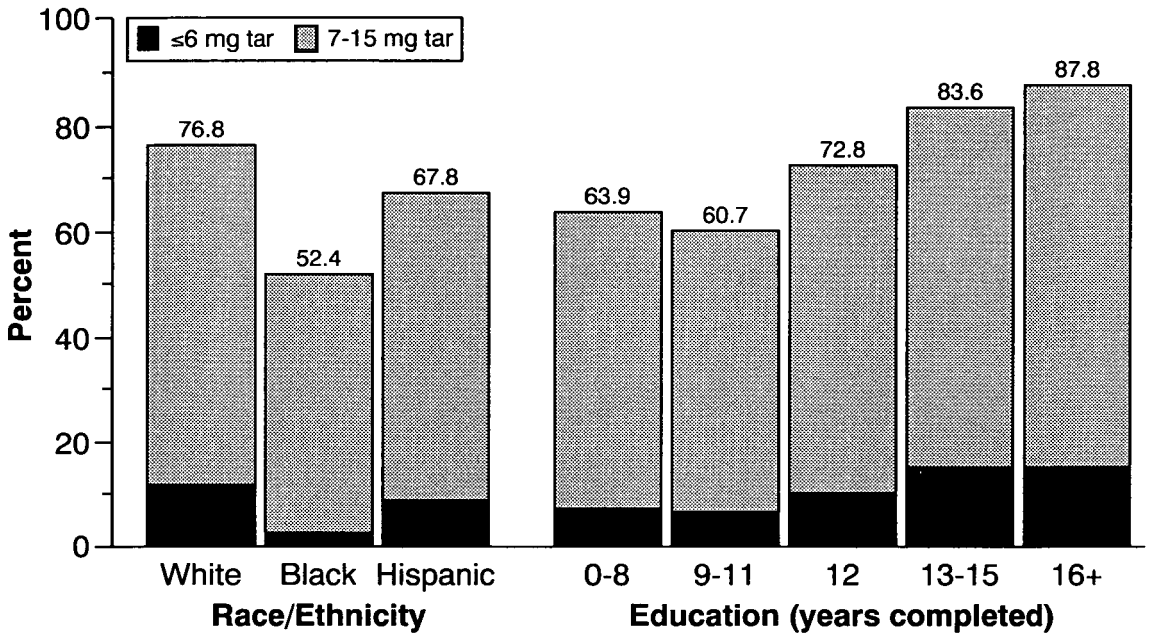


^a Self-reported usual brand.

Source: National Center for Health Statistics, 1987.

Figure 4

Prevalence (by percent) of current smokers' use of cigarette brands^a with ≤ 15 mg tar, by race and education: Ages 18 and older, United States, 1987



^a Self-reported usual brand.

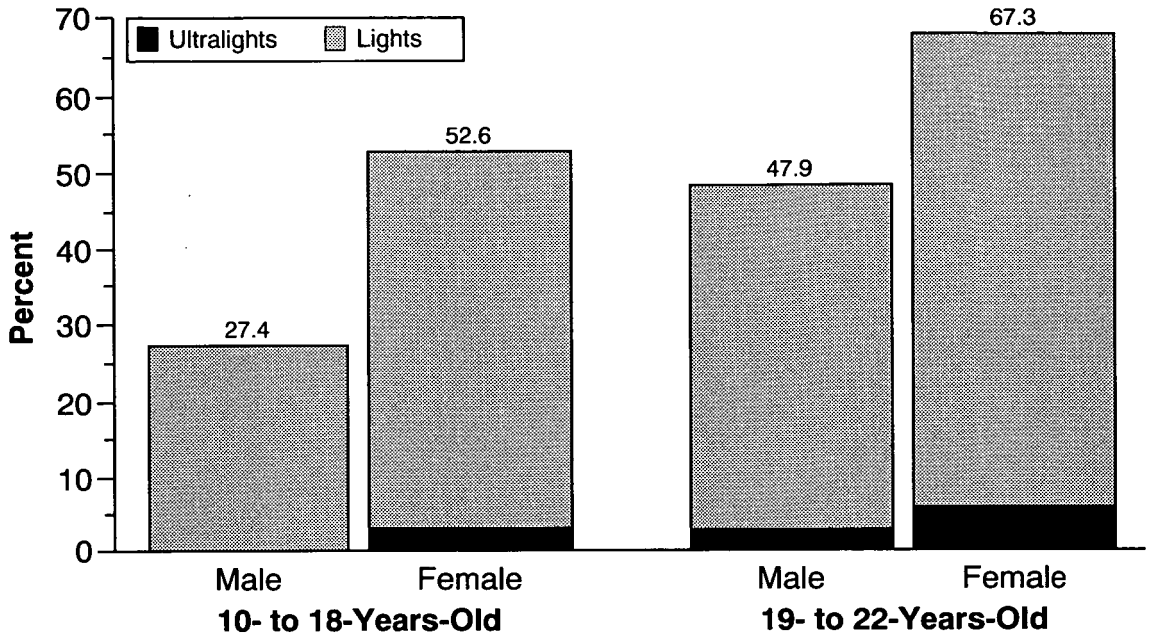
Source: National Center for Health Statistics, 1987.

ultralight?" Of note, "light" and "ultralight" are terms used in advertising and may not correlate precisely with tar and nicotine levels (Davis et al., 1990). However, these are terms that smokers frequently use in describing the brands they smoke.

There are two key findings from the TAPS data. First, among 10- to 18-year-olds and 19- to 22-year-olds, females were more likely than males to smoke light and ultralight cigarettes (Figure 5). Very few males smoked ultralight cigarettes. Second, the proportion of males and females using these brands increased with age. This pattern among young persons (increasing use of light and ultralight brands with increasing age) is reflected in both the 1987 NHIS and the 1993 TAPS.

The 1993 TAPS race and ethnicity findings are similar to those detected by the NHIS: White youth were most likely to smoke light cigarettes (52.6 percent), followed by Hispanic youth (44.5 percent), with much smaller proportions of black youth (15 percent) reporting use of these brands (Figure 6). Anecdotal evidence also indicates that African-American youth begin with higher tar cigarettes (Gallup International Institute, 1992).

Figure 5
Prevalence (by percent) of use of light and ultralight cigarettes among current smokers,^a
by sex and age: Ages 10 to 22, United States, 1993



^a Who usually buy their own cigarettes.

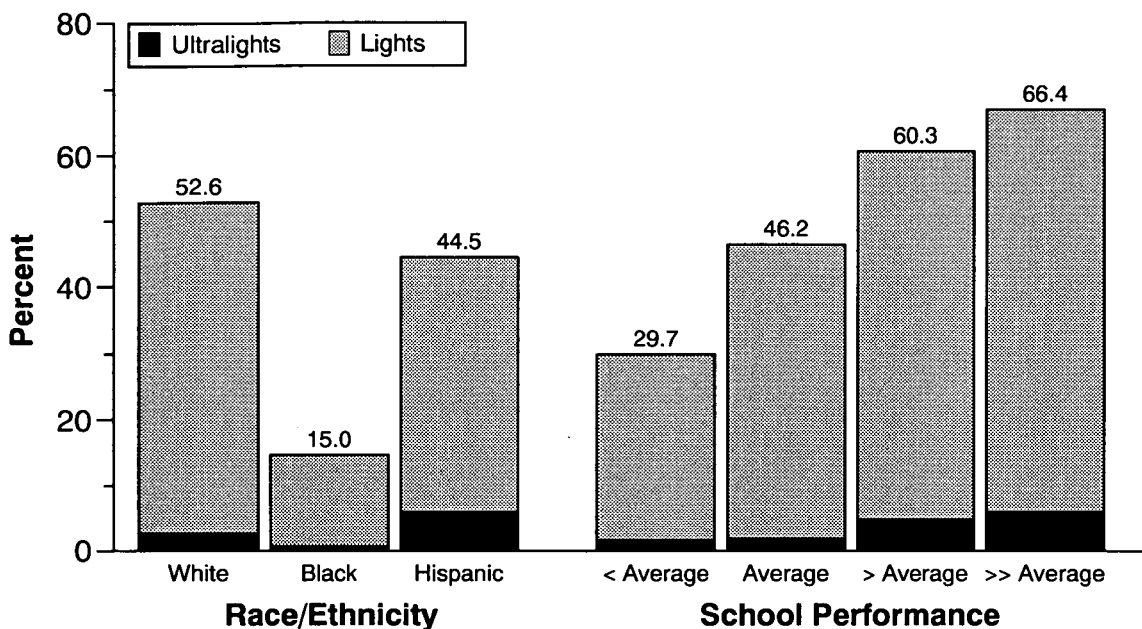
Source: Centers for Disease Control and Prevention, 1993.

In the 1993 TAPS, students were asked to rate how well they were doing in school; the categories used here were less than average, average, better than average, and much better than average. The percentage of young smokers who smoked light or ultralight cigarettes increased with level of performance in school: from 30 percent for those who performed less than average to 66 percent for those who performed much better than average (Figure 6).

Brand Switching Brand switching is one measure of the perceived health risk associated with lower tar yield cigarettes. The 1986 AUTS asked the following question of current smokers: "Thinking of your entire smoking history, have you ever switched from one cigarette to another, just to reduce the amount of tar and nicotine?" Former smokers were asked, "Did you ever switch from one type of cigarette to another just to reduce the amount of tar and nicotine?" Approximately 38 percent of current smokers and 26 percent of former smokers answered "Yes."

The 1987 NHIS asked current smokers, "Have you ever switched to a low tar and nicotine cigarette just to reduce your health risk?" About 44 percent of current smokers answered that they had switched for that reason. As

Figure 6
Prevalence (by percent) of use of light and ultralight cigarettes among current smokers,^a
by race/ethnicity and school performance: Ages 10 to 22 years, United States, 1993



^a Who usually buy their own cigarettes.

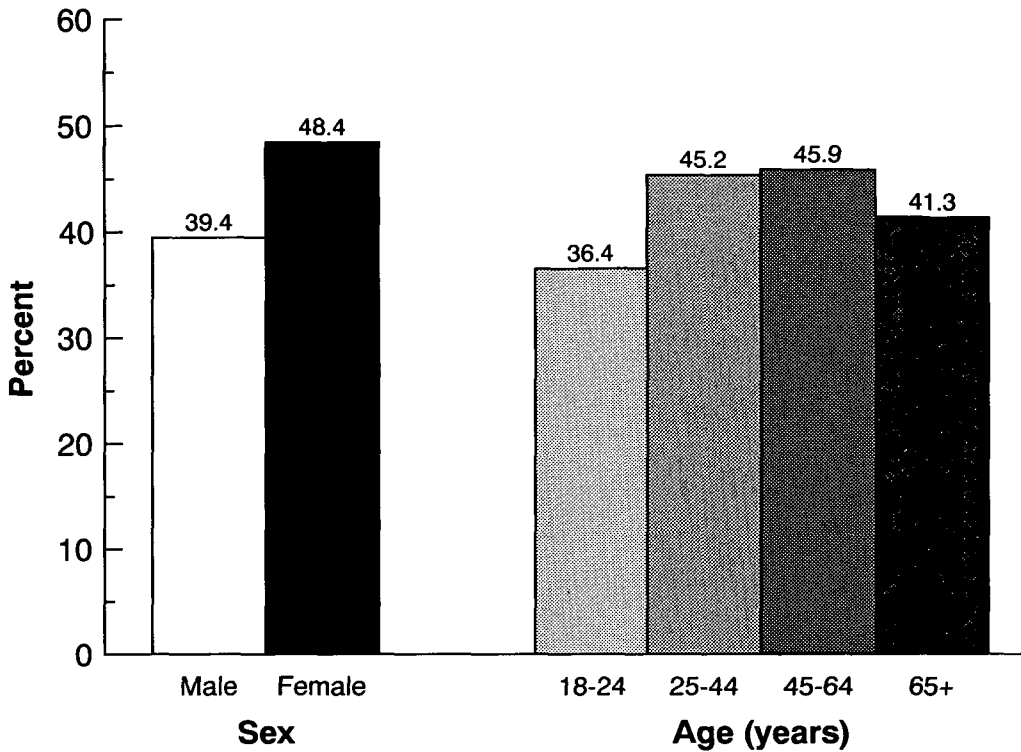
Source: Centers for Disease Control and Prevention, 1993.

shown in Figures 7 and 8, there are clear trends and differences by sex, age, race/ethnicity, and education. Figure 7 shows that females (48.4 percent) were more likely to switch than males (39.4 percent). Smokers in the 25-to-44 and 45-to-64 age groups were most likely to have switched to lower yield brands (45.2 and 45.9 percent, respectively), followed by smokers older than age 64 (41.3 percent) and those 18 to 24 years (36.4 percent). Figure 8 shows that whites (47 percent) were more likely to switch than Hispanics (30.9 percent) or African-Americans (30.8 percent), and the more educated were more likely to switch than the less educated.

Smokers of low-tar yield varieties were more likely to have switched. That is, among smokers consuming brands yielding 6 mg or less tar, 74 percent of current smokers in the 1986 AUTS had ever switched compared with 19 percent of smokers consuming cigarettes yielding 16 mg or more tar. These patterns were similar for both former smokers (as reported by the AUTS) and current smokers (as reported by the NHIS).

Persons who switched brands were more likely to smoke low-tar yield brands. For example, according to the 1986 AUTS, 22 percent of switchers smoked brands yielding 6 mg or less tar compared with 5 percent of people

Figure 7
**Percentage of current smokers who have ever switched brands,^a by sex and age:
 Ages 18 and older, United States, 1987**



^a To lower tar/nicotine brands to reduce their health risks.

Source: National Center for Health Statistics, 1987.

who had never switched. This suggests that many smokers switch to lower tar brands rather than starting with those brands.

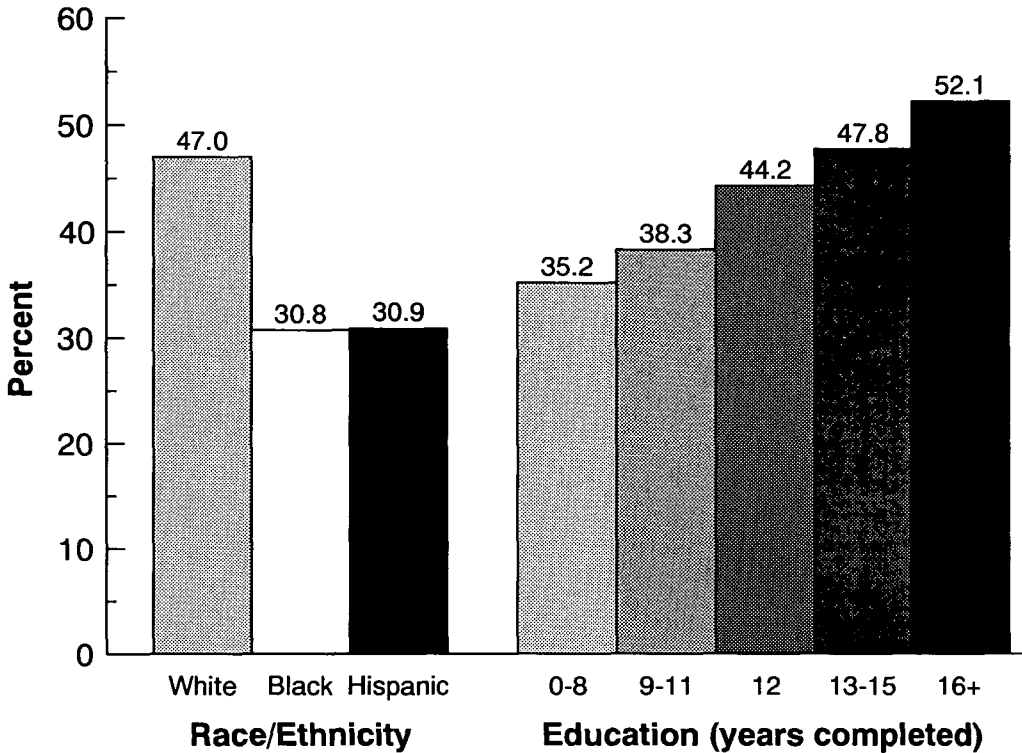
HEALTH BELIEFS AND SWITCHING Survey data on health beliefs shed light on possible factors that may drive or influence smokers' switching to lower tar cigarette brands. The surveys indicate that current smokers of lower tar brands and persons who had switched brands were more likely to acknowledge health risks than those who smoked higher tar brands or who had not switched brands. Figures 9 and 10 illustrate this relationship between tar yield of the smoker's brand and beliefs that smoking is related to cancer and emphysema.

It is worth pointing out that the majority of smokers of high-tar cigarettes, as well as smokers who have never switched, acknowledged the health risks of smoking (Figure 10). However, there is an inverse gradient for both variables.

Similarly, concerns about health risks decrease as tar yields rise (Table 1). Among smokers who switched brands, 85 percent stated that they were

Figure 8

Percentage of current smokers who have ever switched brands,^a by race/ethnicity and education: Ages 18 and older, United States, 1987



^a To lower tar/nicotine brands to reduce their health risks.

Source: National Center for Health Statistics, 1987.

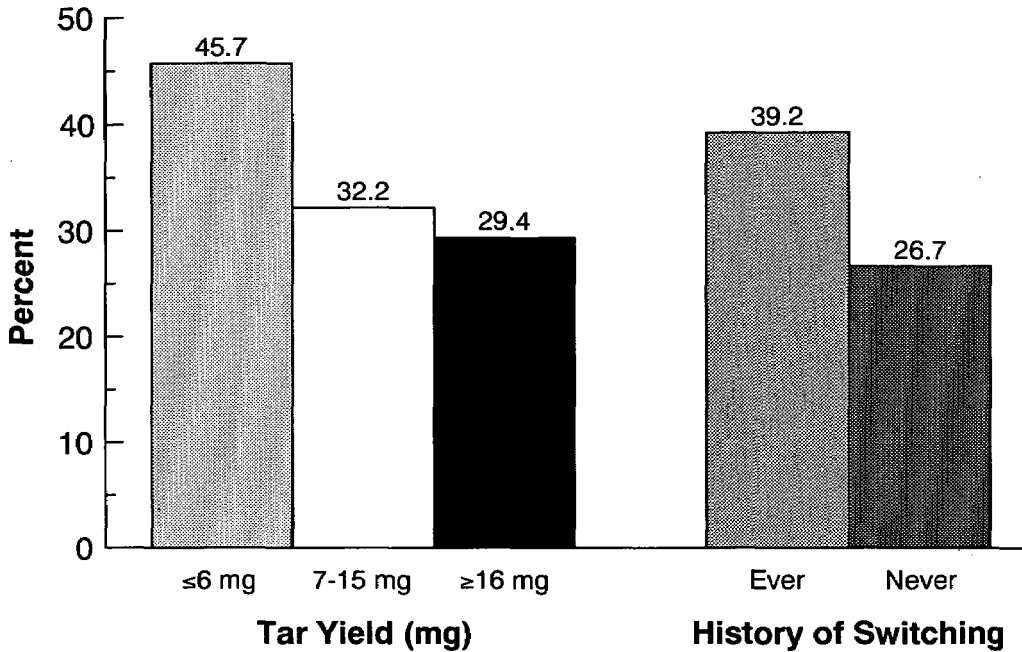
concerned about the health effects of smoking compared with 70 percent of those who had never switched. Furthermore, people in the lower tar yield categories and those who switched were more likely to respond that their health had been affected by their smoking, and they were more likely to report that a doctor had advised them to quit.

Moreover, people who smoke low-tar cigarettes and those who switched were more likely to acknowledge that some brands are more hazardous than others (Table 1). Smokers of low-tar brands were more likely to state that their brand is less hazardous compared with smokers of higher tar brands. Among switchers, 33 percent believed that their brand is less hazardous than other brands. For smokers who had never switched, only 16 percent held this belief.

In the 1993 TAPS, adolescents and young adults who smoked light and ultralight cigarettes were asked why they smoked those brands. Four reasons were most commonly cited: Thirty-three percent of respondents said that

Figure 9

Percentage of current smokers who believe that low-tar cigarettes pose reduced cancer risk, by tar yield and history of switching: Ages 18 and older, United States, 1987



Source: National Center for Health Statistics, 1987.

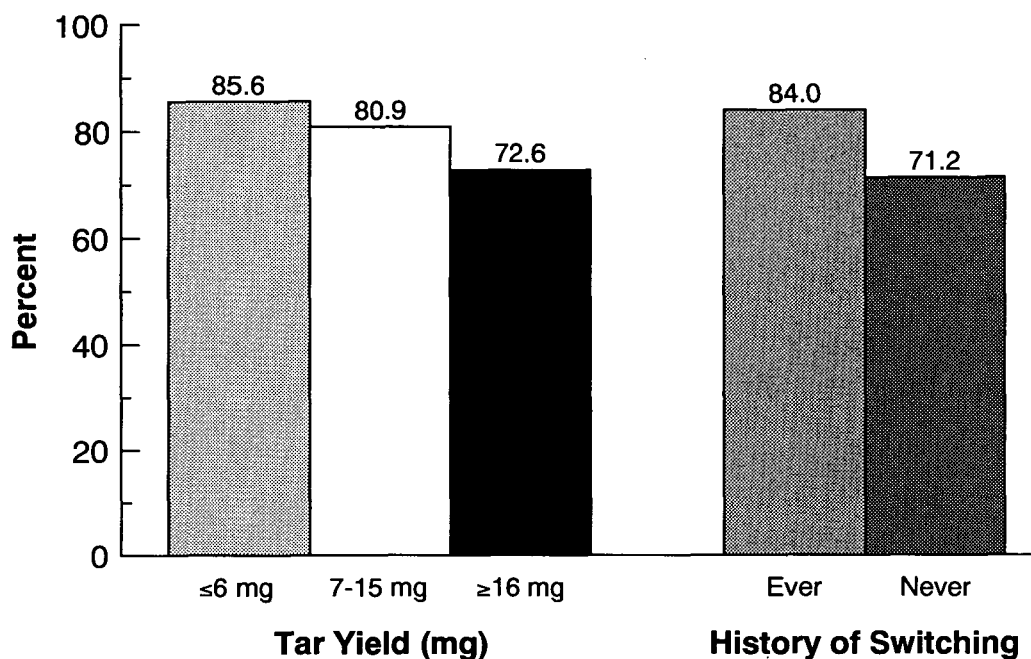
they smoked light or ultralight cigarettes because they taste better, 29 percent said they are less irritating, 21 percent said they thought these cigarettes were healthier than other brands, and 19 percent said they “just liked them.”

QUITTING SMOKING The surveys revealed some interesting trends with regard to quitting. In the 1987 NHIS, participants were asked to identify techniques they had used in their efforts to quit smoking. Among participants who had switched brands, 38 percent said they had ever switched to lower tar and nicotine cigarette brands as a quitting strategy; 62 percent switched for other reasons (Table 2). Switchers were more likely to have tried these quitting strategies, with the exception of quitting cold turkey, than smokers who had never switched. This suggests that switchers were seeking help with quitting. In addition, those who smoked lower tar cigarettes were slightly more likely to have sought help during previous quit attempts than were persons who smoked higher tar cigarettes.

However, the data from the 1986 AUTS indicate that the prevalence of cessation increases with increasing tar yield (Figure 11). That is, ever-smokers who smoked higher tar yield brands were more likely to have quit than people who smoked lower tar brands. Respondents who had never switched were more likely to have quit smoking than switchers.

Figure 10

Percentage of current smokers who believe that cigarette smoking is related to emphysema, by tar yield^a and history of switching^b: Ages 18 and older, United States, 1987



^a Of current brand.

^b Ever switched to lower tar/nicotine brands to reduce health risks.

Source: National Center for Health Statistics, 1987.

Table 1

Health concerns and beliefs of current smokers, by tar yield and history of switching^a, by percent: Ages 17 and older, United States, 1986

	Tar Yield (mg)			History of Switching	
	≤6	7-15	≥16	Ever	Never
Concerned About Health Effects	84	79	68	85	70
Some Brands More Hazardous Than Others	60	46	39	54	40
Their Brand Is Less Hazardous Than Others	48	26	12	33	16

^a Ever switched to reduce tar and nicotine.

Source: Centers for Disease Control, 1986.

Table 2
 Quit strategies ever used by current smokers, by tar yield and history of switching^a, by percent:
 Ages 18 and older, United States, 1987

	Tar Yield (mg)			History of Switching	
	≤6	7-15	≥16	Ever	Never
Switch to Low Tar	37	22	18	38	6
Special Filters	14	9	8	13	4
Gradual Reduction	39	34	36	42	27
Nicotine Gum	16	10	10	12	8
The Great American Smokeout	10	9	8	12	6
Cold Turkey	86	84	82	82	85
Book/Pamphlet	9	9	7	10	5
Relatives/Friends	18	18	18	20	13

^a Switching to lower tar and nicotine brand to reduce health risks.

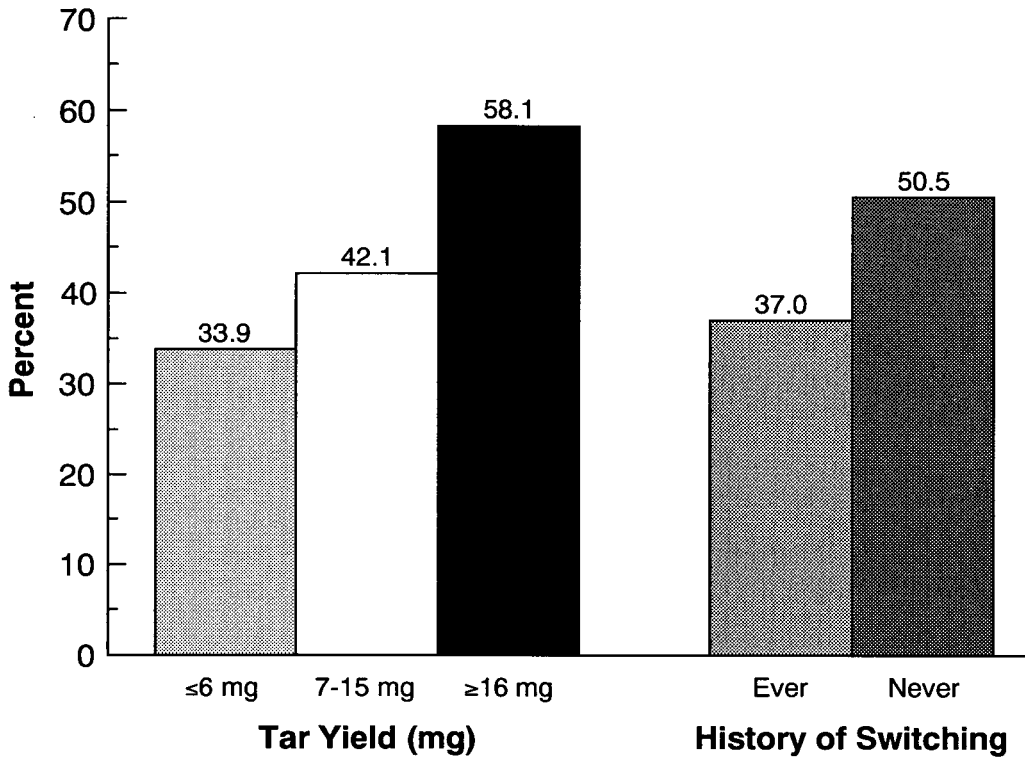
Source: National Center for Health Statistics, 1987.

Among persons who had ever been regular smokers, those who smoked low-tar cigarettes and those who switched to lower tar brands were more likely to have made a recent effort to quit smoking and relapsed and were less likely to be former smokers (data not shown). Among smokers who had never tried to quit, smokers of low-tar cigarettes and those who switched to low-tar cigarettes were more likely to have considered quitting (data not shown).

DISCUSSION These data seem to reflect an interplay of the forces of motivation to quit and nicotine dependence (Russell, 1981). Smokers of lower tar cigarettes appear to be especially interested in quitting and are more actively seeking help than smokers of higher tar cigarettes. Perhaps when lower tar smokers were unsuccessful in their attempts to quit, they switched to a lower tar brand to allay their fears about the health consequences of continuing to smoke. The tacit health claims associated with advertisements of the lower tar brands may have allayed smokers' health concerns (Davis, 1987). Because of the cross-sectional nature of the data, however, further research on the topic is warranted.

Not all switching is a step toward quitting. Three of every five smokers who had ever switched to lower tar and nicotine brands did not do so as a quitting strategy. Both low-tar cigarette smokers and ever-switchers were more likely, compared respectively with high-tar smokers and persons who had never switched brands, to (1) acknowledge the dangers of smoking,

Figure 11
 Prevalence of cessation among ever-smokers, by tar yield and history of switching^a:
 Ages 17 and older, United States, 1986



^a Ever switched to reduce tar/nicotine.

Source: Centers for Disease Control, 1986.

(2) say that their health has been affected, (3) be concerned about health effects, and (4) believe that their cigarettes are safer.

The data on prevalence of cessation are especially intriguing, given that low-tar cigarette smokers and ever-switchers are better educated and it is known that persons with more years of education are less likely to be smokers and more likely to have quit (Centers for Disease Control and Prevention, 1994a; Giovino et al., 1994). These data and the Pollay (1990) observation that the tobacco industry seems to be targeting lower tar yield cigarettes toward more highly educated smokers deserve consideration. The innovation of quitting smoking, which started among persons with more education, may have been replaced by the innovation of switching to lower tar brands (Rogers, 1983; U.S. Department of Health and Human Services, 1989).

As stated by Samet (this volume), available evidence indicates that smoking lower tar cigarettes only minimally reduces smokers' health risks. The reduced prevalence of cessation among smokers who have switched brands and smokers of low-yield cigarettes, coupled with beliefs among some in the public that these cigarettes are safer, suggest that low-yield cigarettes have kept many smokers smoking who otherwise might have quit. The net effect of the introduction and mass marketing of these brands, then, may have been and may continue to be an increased number of smoking-attributable deaths.

QUESTION-AND-ANSWER SESSION

DR. SHIFFMAN: I don't know if you have these data, but I am wondering, when smokers in these surveys make a deliberate switch, do you have a sense of how big a jump they make in the FTC tar and nicotine values?

DR. GIOVINO: We have begun to look at the issue of the penultimate brand vs. the current or the last brand. The reason I can't give you a direct answer is because we looked at it as a function of whether or not they smoke more now or less now. And I will have to check this, but I think it was about .2 mg nicotine.

DR. HOFFMANN: We know now that nicotine is one major reason that people smoke or chew tobacco. Therefore, you could have classified your groupings according to nicotine, which I would have done, because that is why people smoke; it is not for the tar.

DR. GIOVINO: I think the analysis clearly could be done both ways, and I understand your reasoning. The reason that I felt comfortable with tar is because it is based on perceptions. A lot of this is based on perceptions of health risks.

My guess is that they are so highly correlated that the analysis would find very similar findings, and if the committee would like me to do that, we can certainly do that.

DR. PETITTI: This is a pretty technical question, but your last slide had a conclusion that low-tar smokers are less likely to be former smokers and switchers are less likely to be former smokers. I presume those are age adjusted?

DR. GIOVINO: We did age-specific analyses. We did not have time to do age-adjusted analyses. We used three age categories: 17 to 34 years, 35 to 64 years, and 65 plus years. For switching, the relationship held in every category; for low tar, it held in every category except the 17 to 34 category.

DR. BENOWITZ: I wonder if you have any information on smoking of the really ultralows, like 1 mg and below, because there is some evidence that the yields from those are really fundamentally different, and I will be talking about that later. But do you know anything about the characteristics of those smokers?

DR. GIOVINO: The numbers in those categories became very small. You know, at 6 mg or less, it was 10 or 12 percent. At 1 mg, the numbers would have been

DR. BENOWITZ: So, no one is smoking them.

DR. GIOVINO: Very small numbers, yes.

DR. FREEMAN: Do you have any guess or reason why young black males in particular are smoking so much less today, since it is obviously not a function of education. Do you have any sense of why that is happening?

DR. GIOVINO: What Dr. Freeman is referring to are the trends in the High School Senior data, in National Health Interview Survey data among people 18 to 24, in the National Household Survey on Drug Abuse data, the Youth Risk Behavior Survey data, the TAPS data, and others, that show that African-American youth are much less likely to smoke than white youth.

I will take 2 minutes, because it is an interesting study. It is not a school dropout effect, because when we look at dropouts, white kids who have dropped out are much more likely to smoke than African-American kids. Also, regardless of race and ethnicity, all kids who drop out are more likely to smoke.

We don't believe that it is because they have switched to other drugs. We have looked at Monitoring the Future data, and it does not look like cigarette smoking has been replaced by an increased use of alcohol and other drugs.

There are some data to suggest that differential misclassification may explain some of the difference. There was a paper by Karl Bauman in the *American Journal of Public Health* that showed that African-American youth may be a little more likely to differentially underreport in a household survey. Household surveys pose the most serious concerns about confidentiality, unless serious steps are taken to protect confidentiality.

We see lower smoking rates among blacks in school surveys, where there is greater privacy. And even in Bauman's household survey, mean validated tobacco use was three times higher in white youth than in African-American youth.

To answer your question in more detail, variables like discretionary income, parental education, importance of religion, and how well they do in school do not explain it. In other words, the trends seem to be down in African-Americans more than white youth in just about all the subcategories that we have carved out.

There are explanations, and some were presented in the 1994 Surgeon General's report: There have been changes in attitudes about smoking, and the attitudes held by African-American youth changed in a much more health-promoting direction than the attitudes among white youth. There

appears to have been some sort of social climate change, such that cigarette smoking does not appear to be as socially acceptable among African-Americans; there are certainly some reports of grassroots involvement at the church and other levels.

There also appears to be a differential concern about the potential weight-controlling effects of cigarettes, with African-American youth being less obsessed with slimness than white youth.

It is a very intriguing phenomenon and one that we have examined in detail.

DR. FREEMAN: Is this reflected in the 18- to 24-year-old group?

DR. GIOVINO: The prevalence trends have definitely translated into the 18- to 24-year-old age group, and even in the 25 to 29 age group. African-Americans start smoking about a year later in life, but the differences we are seeing are not enough, and we are definitely seeing translation into the young adult population.

DR. STITZER: One more question on the youth. Your data seem to contradict the popular wisdom that youth begin with light cigarettes. I wondered if there were any data suggesting that they do play some role in initiation or original experimental use?

DR. GIOVINO: Some of that dogma, if I understand it right, is that it might have influenced young girls starting because they were less irritating, and that seems to be part of the scenario. Young girls are more likely to have used the lights or the ultralights, to the extent that the cross-sectional data can tell us exactly.

I find myself thinking this, and again, this is hypothesis generation: You see a lot more ads for regular cigarettes than you do for light cigarettes, especially if you think about Marlboros, Camels, Newports, etc. Regardless of the reason, it is possible that they start on the regulars, that the thought of quitting occurs to them, they have difficulty quitting and the thought is, "Well, I have got to do something here, so maybe I will switch." It is a hypothesis.

DR. KOZLOWSKI: A number of years ago, Fred Silverstein, Scott Feldon, and I published a paper in the *Journal of Health and Social Behavior* on the role of low-yield cigarettes and the recruitment to smoking, particularly in women, we found, in a school sample.

And you have to think that there were some young women who were particularly sensitive to the effects of smoking. Not all were. In other words, a small percentage of the market were under great social pressure to take up smoking, and the low-yield cigarette, smoked without vent blocking and so on, provided a nice trial-sized dose. So, it helped some people, but it was not across the board.

REFERENCES

- Anonymous. Health claims made for filter cigarettes. *New York State Journal of Medicine* 85(7): 317, 1985.
- Anonymous. Vantage is changing a lot of my feelings about smoking. *Time Magazine*, November 7, 1977. pp. 86-87.
- Centers for Disease Control and Prevention. Adult Use of Tobacco Survey. Public use data tape, 1986.
- Centers for Disease Control and Prevention. Teenage Attitudes and Practices Survey. Public use data tape, 1993.
- Centers for Disease Control and Prevention. Cigarette smoking among adults—United States, 1993. *MMWR. Morbidity and Mortality Weekly Report* 43: 925-930, 1994a.
- Centers for Disease Control and Prevention. Changes in cigarette brand preferences of adolescent smokers—United States, 1989-1993. *MMWR. Morbidity and Mortality Weekly Report* 43: 577-581, 1994b.
- Davis, R.M. Current trends in cigarette advertising and marketing. *New England Journal of Medicine* 316: 725-732, 1987.
- Davis, R.M., Healy, P., Hawk, S.A. Information on tar and nicotine yields on cigarette packages. *American Journal of Public Health* 80: 551-553, 1990.
- Doll, R., Hill, A.B. Smoking and carcinoma of the lung. *British Medical Journal* 2: 740-748, 1950.
- Doll, R., Hill, A.B. A study of the aetiology of carcinoma of the lung. *British Medical Journal* 2: 1271-1286, 1952.
- Federal Trade Commission. "Tar," *Nicotine and Carbon Monoxide of the Smoke of 207 Varieties of Domestic Cigarettes*. Washington, DC: Federal Trade Commission, 1985.
- Federal Trade Commission. *Federal Trade Commission Report to Congress for 1992*. Washington, DC: Federal Trade Commission, 1994.
- Gallup International Institute. *Teen-age Attitudes and Behavior Concerning Tobacco. Report of the Focus Groups*. Princeton, NJ: The George H. Gallup International Institute, 1992.
- Gallup Organization, Inc. *The Public's Attitudes Toward Cigarette Advertising and Cigarette Tax Increase*. Princeton, NJ: The Gallup Organization, Inc., 1993, pp. 22-24.
- Giovino, G.A., Schooley, M.W., Zhu, B.P., Chrismon, J.H., Tomar, S.L., Peddicord, J.P., Merritt, R.K., Husten, C.G., Eriksen, M.P. Surveillance for selected tobacco-use behaviors—United States, 1900-1994. *MMWR. Morbidity and Mortality Weekly Report* 43(3): 1-43, 1994.
- Harris, J.A. *Working Model for Predicting the Consumption and Revenue Impacts of Large Increases in the U.S. Federal Cigarette Excise Tax*. Working paper no. 4803. Cambridge, MA: National Bureau of Economic Research, 1994.
- Levin, M.L., Goldstein, H., Gerhardt, P.R. Cancer and tobacco smoking: A preliminary report. *Journal of the American Medical Association* 143: 336-338, 1950.
- Miller, R. U.S. cigarette consumption, 1900 to date. In: *Tobacco Yearbook*, W. Harr (Editor). Bowling Green, KY: Cockrel Corporation, 1981, p. 53.
- National Center for Health Statistics. National Health Interview Survey Cancer Control Supplement. Public use data tape, 1987.
- Norr, R. Cancer by the carton. *Reader's Digest* December: 7-8, 1952.
- Pierce, J.P., Hatzianandreu, E.H., Flyer, P., Hull, J., Maklan, D., Morganstein, D., Schreiber, G. *Report of the 1986 Adult Use of Tobacco Survey*. OM 90-2004. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Office on Smoking and Health, 1990.
- Pillsbury, H.C., Bright, C.C., O'Connor, K.J., Irish, F.W. Tar and nicotine in cigarette smoke. *Journal of Official Analytical Chemists* 52: 458-462, 1969.
- Pollay, R.W. "The Functions and Management of Cigarette Advertising." Unpublished manuscript, University of British Columbia, 1990. 20 pp.
- Rogers, E.M. (Editor). *Diffusion of Innovations*. New York: Free Press, 1983.
- Russell, M.A. Dependence and motivation to stop smoking. In: *Smoking and Arterial Disease*, R.M. Greenhalgh (Editor). Bath, United Kingdom: Pitman Medical, 1981, pp. 285-288.
- Schoenborn, C.A., Boyd, G. *Smoking and Other Tobacco Use: United States, 1987*. Vital and Health Statistics. Series 10: Data From the National Health Interview Survey (No. 169). DHHS Publication No. (PHS) 89-1597. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, 1989.
- Slade, J. The tobacco epidemic: Lessons from history. *Journal of Psychoactive Drugs* 21: 281-291, 1989.
- U.S. Department of Agriculture. *Tobacco Situation*. TS 99. Washington, DC: U.S. Department of Agriculture, Economic Research Service, 1962.
- U.S. Department of Agriculture. *Tobacco Situation and Outlook Report*. TS 200. Washington, DC: U.S. Department of Agriculture, Commodity Economics Division, Economic Research Service, 1987.
- U.S. Department of Agriculture. *Tobacco Situation and Outlook Report*. TS 226. Washington, DC: U.S. Department of Agriculture, Commodity Economics Division, Economic Research Service, 1994.
- U.S. Department of Health and Human Services. *The Health Consequences of Smoking for Women. A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health, Office on Smoking and Health, 1980.

U.S. Department of Health and Human Services. *The Health Consequences of Smoking: Nicotine Addiction. A Report of the Surgeon General, 1988*. DHHS Publication No. (CDC) 88-8406. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Health Promotion and Education, Office on Smoking and Health, 1988.

U.S. Department of Health and Human Services. *Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Surgeon General, 1989*. DHHS Publication No. (CDC) 89-8411. Rockville, MD: 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.

U.S. Department of Health, Education, and Welfare. *Smoking and Health: A Report of the Advisory Committee to the Surgeon General of the Public Health Service*. PHS Publication No. 1103. Rockville, MD: U.S. Department of Health, Education, and Welfare, Public Health Service, 1964.

Warner, K.E. Tobacco industry response to public health concern: A content analysis of cigarette ads. *Health Education Quarterly* 12: 115-127, 1985.

Wynder, E.L., Graham, E.A. Tobacco smoking as a possible etiological factor in bronchogenic carcinoma. A study of six hundred and eighty-four proved cases. *Journal of the American Medical Association* 143: 329-336, 1950.