USDHHS 1989b). Since the recalled age at initiation is often 10 or more years younger than the age of the respondent at the time of the survey, recall bias may affect the reliability of these estimates.

In the 1991 NHSDA, 69 percent of respondents aged 30 through 39 years reported trying a cigarette by age 18. Of all persons who had ever tried a cigarette, 88 percent had tried their first cigarette by age 18. The mean age of first trying a cigarette was 14.5 years. Thirty-five percent of the respondents had become daily smokers by age 18. Of those who had ever smoked daily, 71 percent had smoked daily by age 18. The mean age of becoming a daily smoker was 17.7 years.

Surveys conducted in 1991 among school-aged students, while lacking information on postadolescent initiation, provide information of more recent initiation patterns (i.e., during the 1980s and early 1990s). Among 12th-grade students surveyed in 1991, 22 percent of TAPS respondents, 40 percent of NHSDA respondents, 40 percent of MTFP respondents, and 37 percent of YRBS respondents first tried a cigarette by age 14 (Table 8). About 60 percent of the respondents in the NHSDA, the MTFP, and the YRBS and about 50 percent of the TAPS respondents had smoked by their senior year. Daily cigarette use began by age 16 (or the 10th grade) for 18 to 23 percent of respondents to the NHSDA, the MTFP, and the YRBS (Table 9). By their senior year, 22 to 29 percent of these respondents had become daily smokers.

Other Patterns of Smoking

Two of the surveys gathered further information about smoking patterns—the number of days per month an adolescent smoked and the number of cigarettes the adolescent smoked per day. In the 1991 YRBS, responses indicated that in general, the greater number of days students reported smoking during the 30 days preceding the survey, the greater the number of cigarettes they smoked per day (Table 10). For example, 49 percent of students who smoked cigarettes on only one or two days during the preceding 30 days smoked fewer than one cigarette per day; among students who smoked cigarettes on all 30 days, 47 percent smoked 11 or more per day.

Smoking patterns were also reported recently by Moss et al. (1992), using 1989 TAPS data (Table 11). About 41 percent of teenage smokers—whether male or female—smoked every day, and about one in four smoked on fewer than five of the preceding 30 days. The percentage of smokers who smoked every day increased with increasing age; 48 percent of 16- through 18-year-old smokers smoked every day. About twice as many white as black teenagers smoked every day (42 vs. 22 percent), and blacks were more likely than whites to have smoked on fewer than five days. Non-Hispanics were more likely than Hispanics to smoke every day.

Sixteen percent of 12- through 18-year-old TAPS respondents who smoked during the week preceding the survey smoked 20 or more cigarettes daily. Males smoked more cigarettes daily than females. Older students smoked more cigarettes daily than younger students; 47 percent of 16- through 18-year-old smokers and 11 percent of 12- and 13-year-old smokers reported smoking 10 or more cigarettes daily. Whites smoked more cigarettes daily than blacks, and non-Hispanics

Table 10. Percent distribution of the number of cigarettes smoked per day, by the number of days on which cigarettes were smoked during the 30 days preceding the survey, Youth Risk Behavior Survey, United States, 1991

Number of days cigarettes were smoked	Cigarettes smoked per day							
	< 1	1	2–5	6–10	11–20	> 20	Total	N
1–2	49.2	29.2	18.0	1.7	1.0	0.2	100	756
3–5	25.3	29.2	41.5	3.6	0.4	0.0	100	452
6–9	7.0	32.5	54.4	5.8	0.4	0.0	100	273
10–19	7.4	13.0	66.5	10.8	1.8	0.4	100	326
20–29	0.7	4.6	61.4	27.9	5.4	0.0	100	294
30	0.1	0.3	26.5	26.0	36.6	10.8	100	803
Average	14.8	15.0	37.2	14.8	14.1	4.0	100	2,904

Source: Centers for Disease Control and Prevention, Division of Adolescent and School Health (unpublished data).

Table 11. Percentage of current smokers by the number of days smoked during the past month and the average number of cigarettes smoked daily, by gender, age, and race/Hispanic origin, Teenage Attitudes and Practices Survey, United States, 1989

	Number of days smoked during past month*				Number of cigarettes smoked daily†			
Category	< 5	5–9	10–29	Every day	< 5	5–9	10–19	≥ 20
Overall	24.1	8.7	26.4	40.8	37.9	20.4	25.7	16.0
Gender								
Male	23.9	8.5	26.6	41.0	33.9	19.3	27.6	19.2
Female	24.3	8.9	26.2	40.6	42.7	21.6	23.5	12.1
Age (years)								
12–13	51.9	8.3‡	23.3	16.5‡	64.3	24.6‡	11.0‡	0.0
14–15	28.4	9.8	34.5	27.3	55.5	17.2	23.0	4.3‡
16–18	20.0	8.4	24.1	47.5	31.6	21.1	27.2	20.1
Race								
White	23.4	8.4	26.2	42.0	36.6	20.1	26.5	16.8
Black	37.0	15.0‡	26.5	21.6	60.3	20.5‡	16.3‡	2.9‡
Hispanic origin								
Hispanic	30.7	11.2‡	31.9	26.3	59.2	22.5	11.6‡	6.6‡
Non-Hispanic	23.5	8.5	26.0	42.0	36.3	20.2	26.9	16.7

Source: Moss et al. (1992).

*Excludes unknown number of days smoked.

†Excludes unknown number of cigarettes smoked daily and none smoked during the past week.

‡Estimate does not meet standards of reliability or precision (< 30 percent relative standard error).

were heavier smokers than Hispanics. Thus, not only were black and Hispanic adolescents less likely to smoke than whites, but those who did smoke, smoked fewer cigarettes each day than their white adolescent counterparts.

On average, persons 12 through 18 years old who smoked the week before the survey (N = 1,099) smoked 9 cigarettes each day. Males smoked 10 cigarettes daily and females smoked 8. Whites averaged 9 cigarettes per day and blacks averaged 6 (1989 TAPS, CDC, Office on Smoking and Health [OSH], unpublished data). The overall average for adult smokers is 19 cigarettes a day (CDC 1992a).

Initiation Continuum of Smoking

The 1989 Surgeon General's report on smoking and health described the continuum of smoking behavior as one that occurs in four stages: initiation, experimentation, regular smoking, and dependence or addiction (USDHHS 1989b). The report also acknowledged a preparatory stage that occurred before any initial smoking (Flay et al. 1983). These five stages are examined in detail in Chapter 4 (see "Developmental Stages of Smoking").

Data from the 1989 TAPS were used to create an initiation continuum similar to the smoking continuum for adults that was described in the 1989 Surgeon General's report (Pierce and Hatziandreu 1990; USDHHS 1989b). This initiation continuum incorporates measures of smoking behavior and measures of the possibility that a respondent will smoke in the future. In 1989, 54.5 percent of persons 12 through 18 years old reported that they had never smoked a cigarette, not even a few puffs (Table 12). These respondents were asked to report (1) whether they thought they would try a cigarette soon ("yes," "no," and "don't know"), (2) whether they would

Table 12. Percent distribution of an initiation continuum for cigarette smoking among persons aged 12–18 years, by age, gender, and race/Hispanic origin, Teenage Attitudes and Practices Survey, United States, 1989

Uptake continuum category		Age (years)				Gender		Race/Hispanic origin		
		Overall	12–14	15–16	17–18	Male	Female	White/ non-Hispanic	Black/ non-Hispanic	Hispanic
1.	Never tried smoking, not susceptible	44.3	55.5	40.1	32.9	42.0	46.8	42.3	54.0	40.3
2.	Never tried smoking, susceptible	10.2	15.8	8.4	4.3	10.1	10.3	9.4	10.5	15.9
3.	Tried smoking, not a whole cigarette, not susceptible	7.9	6.6	8.3	9.5	8.6	7.2	7.1	12.7	8.0
4.	Tried smoking, not a whole cigarette, susceptible	3.3	4.3	3.2	2.1	3.8	2.7	2.6	5.2	5.4
5.	Smoked 1–99 cigarettes, but none in the last 30 days, and not intending to smoke in a year	13.5	7.5	16.6	18.8	13.6	13.4	14.6	9.6	12.6
6.	Smoked 1–99 cigarettes, but none in the last 30 days, and might smoke in a year	4.1	4.2	4.8	3.1	4.2	3.9	4.4	1.9	5.4
7.	Smoked ≥ 100 cigarettes, but none in the last 30 days, and not intending to smoke in a year	0.9	0.2	1.0	1.9	1.2	0.7	1.2	0.0	0.8
8.	Smoked ≥ 100 cigarettes, but none in the last 30 days, and might smoke in a year	0.4	0.2	0.4	0.7	0.4	0.4	0.5	0.3	0.5
9.	Smoked 1–99 cigarettes, at least some in the past 30 days	5.9	3.7	7.3	7.4	5.8	5.9	6.3	4.1	5.6
10.	Smoked ≥ 100 cigarettes and smoked on 1–19 days during the past 30 days	2.2	0.7	2.6	3.8	2.3	2.0	2.6	0.6	1.7
11.	Smoked at least 100 cigarettes and smoked on at least 20 days during the past 30 days	7.3	1.3	7.5	15.5	7.8	6.7	9.1	1.2	4.0

Source: Centers for Disease Control and Prevention, Office on Smoking and Health (unpublished data).

smoke a cigarette if one of their best friends were to offer them one ("definitely yes," "probably yes," "probably not," "definitely not," and "don't know"), and (3) whether they thought they would be smoking cigarettes in one year ("definitely yes," "probably yes," "probably not," "definitely not," and "don't know"). Never smokers who answered "no" to the first question, "definitely not" to the second question, and "definitely not" to the third question were categorized as "not susceptible" to smoking. Those who answered these three questions in any other way were considered susceptible to smoking in the future (Pierce et al. 1993). According to these criteria, 44 percent of all TAPS respondents had never tried a cigarette and were not considered susceptible to smoking, and 10 percent had never tried smoking but were considered susceptible.

Adolescents who had tried smoking but had not smoked a whole cigarette accounted for 11 percent of TAPS respondents; 8 percent were judged to be not susceptible to smoking in the future, and 3 percent were judged susceptible. Those who had smoked at least one cigarette were only asked question 3, above, concerning whether or not they thought they would be smoking in a year. A large category (14 percent of all respondents) was composed of those who had smoked at least 1 but fewer than 100 cigarettes, who had not smoked in the preceding 30 days, and who definitely did not intend to smoke in a year. Another 4 percent had smoked from 1 to 99 cigarettes, had not smoked in the preceding 30 days, and were not definite in their resolve to not be smoking in a year. Slightly more than 1 percent of TAPS respondents had smoked at least 100 cigarettes but had not smoked in the preceding 30 days; these respondents are considered to be former smokers (USDHHS 1989b, 1990b).

Finally, among the 15 percent of respondents who smoked in the preceding 30 days, about 45 percent (6 percent of all respondents) had smoked fewer than 100 cigarettes in their lifetime. Although current smokers, these persons were still at a relatively early stage in the process of smoking initiation. Among those who had smoked at least 100 cigarettes and had smoked in the preceding month, more than three-fourths (7 percent of all respondents) had smoked on 20 or more of those 30 days.

The distribution of this continuum was similar for males and females. White adolescents were more likely to be further along the continuum than were Hispanic and black adolescents.

Cigarette Brand Preference

Knowing what brands of cigarettes are preferred by young smokers may aid the development of smoking prevention programs and may provide insight into the influence that cigarette advertising may have on young people.

In 1978–1980, the NHIS assessed the brands of cigarettes most often used by current smokers (CDC, OSH, unpublished data). Among 707 respondents who were 18 or 19 years old, the most commonly used brands were Marlboro (37 percent), Kool (14 percent), Salem (10 percent), Winston (9 percent), Newport (8 percent), Virginia Slims (5 percent), Merit (4 percent), Benson & Hedges (3 percent), and Camel (2 percent). Ten percent of females and no males used Virginia Slims. Among whites, Marlboro (42 percent), Kool (10 percent), Winston (10 percent), Salem (8 percent), Virginia Slims (6 percent), and Newport (6 percent) were the most commonly used brands. Among blacks, Kool (46 percent), Newport (25 percent), Salem (20 percent), and Benson & Hedges (6 percent) were the most commonly smoked brands.

In the 1989 TAPS, adolescent respondents who generally bought their own cigarettes were asked what brand they usually purchased. More than two-thirds of these smokers usually purchased Marlboro (Table 13). Preference for Marlboro did not differ appreciably by gender, Hispanic origin, age, or region of the country. White adolescent smokers were much more likely to smoke Marlboro cigarettes than were black adolescent smokers (71 vs. 9 percent).

The next most popular brands, Newport and Camel, each accounted for only 8 percent of the overall population's preference. Black smokers, however, were much more likely to smoke Newport cigarettes than were white smokers (61 vs. 6 percent), although sample sizes of blacks were small. Smokers who resided in the Northeast and the Midwest were more likely to smoke Newport cigarettes than were smokers in the South and the West. Among white adolescents, Newport was more popular in the Northeast (14 percent) and the Midwest (7 percent) than in the South (1 percent) and the West (1 percent) (CDC 1992b). The Camel brand was more popular among male (11 percent) than female smokers (5 percent), among white (8 percent) than black smokers (3 percent), and among smokers residing in the West (18 percent) than among those residing in the other three regions (from 4 to 7 percent).

Several nonnational studies conducted since the 1989 TAPS suggest that Camel cigarettes may be gaining in popularity among young smokers. In a 1990 survey of ninth-grade students in 10 U.S. communities included in the Community Intervention Trial for Smoking Cessation (COMMIT) evaluation, 43 percent of smokers who usually bought their own cigarettes bought Marlboro, 30 percent bought Camel, and 20 percent bought Newport (CDC 1992b). As TAPS data also indicated, adolescent smokers residing in communities in the western

Table 13. Percent distribution of cigarette brands that 12–18-year-old current smokers* reported usually buying, by gender, race/Hispanic origin,† age, and region, Teenage Attitudes and Practices Survey, United States, 1989

Category	Number	Marlboro	Newport	Camel	Winston	Benson & Hedges	Salem	Kool	Merit	Vantage	Other
Overall‡	865	68.7	8.2	8.1	3.2	1.5	1.4	1.0	0.5	0.1	7.3
Gender											
Male	477	68.9	7.3	10.9	3.6	0.5	0.2	1.9	0.7	0.2	6.0
Female	388	68.4	9.4	4.6	2.6	2.9	2.9	0.0	0.3	0.0	8.9
Race											
White	807	71.4	5.6	8.4	3.4	1.0	1.3	0.6	0.5	0.1	7.6
Black	41	8.7	61.3	3.1	0.0	9.7	3.3	10.9	0.0	0.0	2.9
Hispanic origin											
Hispanic	46	60.9	12.8	7.6	0.0	2.8	3.7	5.8	0.0	0.0	6.5
Non-Hispanic	817	69.1	8.0	8.1	3.3	1.5	1.3	0.8	0.5	0.1	7.3
Age (years)											
12–15	195	74.8	6.1	8.7	2.5	0.9	0.4	1.1	0.0	0.0	6.5
16–18	670	67.0	8.8	7.9	3.3	1.7	1.6	1.0	0.6	0.1	7.8
Region											
Northeast	184	68.4	16.2	4.1	0.0	2.3	0.0	0.0	0.6	0.5	7.9
Midwest	247	70.2	10.0	7.3	3.4	2.2	0.0	1.1	0.5	0.0	5.3
South	281	67.2	5.0	6.1	6.2	1.1	2.9	2.1	0.4	0.0	9.1
West	153	69.6	2.0	18.1	0.7	0.6	2.3	0.0	0.6	0.0	6.2
Overall market share, 1989		26.3	4.7	3.9	9.1	6.2	3.9	5.9	3.8	2.5	33.7

Sources: Centers for Disease Control (1992b); Maxwell (1992).

*Persons who reported smoking on one or more of the 30 days preceding the survey.

†Excludes the racial category "other" (N = 17). Ethnicity for two persons was unknown.

‡Data were weighted to provide national estimates.

United States showed more preference for Camel cigarettes than did smokers from other regions of the nation. Other studies conducted after TAPS report rates of Camel preference among adolescent smokers that are consistent with the COMMIT survey results (DiFranza et al. 1991; Pierce, Gilpin, et al. 1991).

In June and July 1992, the George H. Gallup International Institute (1992) conducted a telephone survey of a nationwide sample of 1,125 youths 12 through 17 years old. Smokers (those who reported having smoked at least one cigarette during the 30 days preceding the interview) were disproportionately oversampled, and the data were weighted to represent the adolescent population. Smokers were asked, "Thinking now about the last time you bought cigarettes for yourself, what brand did you happen to buy on that occasion?" Marlboro was the brand bought by 53 percent of these teenage smokers, Camel by 16 percent, and Newport by 8 percent. The most popular brand among blacks in this survey was Newport (54 percent preference).

Trends in Cigarette Smoking

Ever Smoking

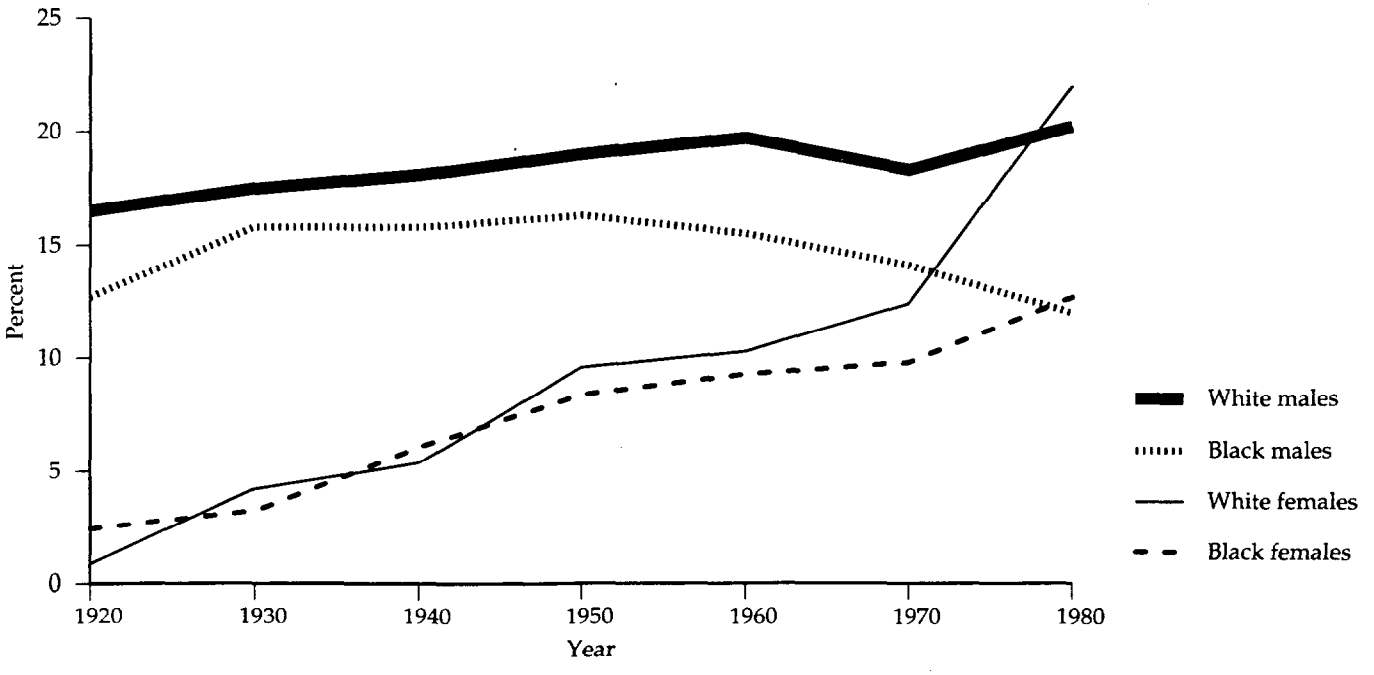
Data from the NTTS, the NHSDA, and the MTFP suggest that the prevalence of ever smoking among adolescents has declined since the 1970s (Table 14). In the NHSDA, the prevalence of smoking among youths 17 through 19 years old declined from 78 percent in 1979 to 64 percent in 1991, an average decline of 1.2 percentage points per year. In the MTFP, the prevalence among 17- and 18-year-olds decreased from 76 percent in 1977 to 62 percent in 1992, an average decline of 0.9 percentage points per year. In the NHIS, the percentage of 18- and 19-year-olds who had smoked at least 100 cigarettes dropped from 41 percent in 1974 to 25 percent in 1991, an average decline of 1.0 percentage points each year.

Current Smoking

NHIS data have been used to examine historical trends in smoking by reconstructing the prevalence of cigarette smoking for the decades in this century before systematic surveillance of cigarette smoking was conducted (USDHHS 1980, 1985, 1991b; Harris 1983). Using information on a respondent's date of birth, age at initiation of fairly regular smoking, and duration of abstinence (for former smokers), the smoking status of the respondent can be assessed for any given year. For this report, the reconstructed prevalence of smoking among those aged 10 through 19 years is reported for the years 1920 through 1980.

Except for 1980, smoking during this 60-year period was more common among white and black adolescent males than among white and black adolescent females (Figure 1). The prevalence of cigarette smoking

Figure 1. Trends in the reconstructed prevalence* of cigarette smoking among 10–19-year-olds, by gender and race, United States, 1920–1980



Source: U.S. Department of Health and Human Services (1991b). Data sources are the 1970, 1978, 1979, 1980, and 1987 National Health Interview Surveys.

*The smoking prevalence for each of the years indicated was calculated for people who would have been 10–19 years old in each of those years by using the survey respondents' date of birth, age when they first began smoking regularly, and age when they quit smoking (see Appendix 2).

Table 14. Trends in the prevalence (%) of ever smoking among young people, National Teenage Tobacco Surveys (NTTS), National Household Surveys on Drug Abuse (NHSDA), Monitoring the Future Project (MTFP), National Health Interview Surveys (NHIS), United States, 1968–1992

Year	NTTS*	NHSDA†	MTFP‡	NHIS§
1968	36.1			
1970	40.8			
1972	39.2			
1974	41.3	69.5		41.1
1976		64.1	75.4	
1977		67.8	75.8	
1978			75.3	36.7
1979	34.0	78.1	74.0	39.3
1980			71.0	34.1
1981			71.0	
1982		72.6	70.1	
1983			70.6	34.5
1984			69.7	
1985		63.2	68.8	29.8
1986			67.6	
1987			67.2	26.2
1988		66.2	66.4	27.7
1989			65.7	
1990		61.4	64.4	27.6
1991		63.6	63.1	25.3
1992			61.8	

Sources: **NTTS**: U.S. Department of Health, Education, and Welfare (USDHEW) (1972, 1976, 1979b); **NHSDA**: Centers for Disease Control and Prevention (CDC), Office on Smoking and Health (OSH) (unpublished data on 1974–1991 surveys); **MTFP**: Johnston, O'Malley, Bachman (in press); **NHIS**: CDC, OSH (unpublished data on 1974–1991 surveys).

*NTTS, aged 17–18 years. Published reports (USDHEW 1972, 1976, 1979b) merge never smokers and experimenters (those who tried or experimented with smoking, but who had not yet smoked 100 cigarettes) into one category. By definition, therefore, the NTTS will underestimate the percentage of ever smokers. The trends, however, use the same definition.

†NHSDA, aged 17–19 years. Those who reported in 1974, 1976, and 1977 that they were current smokers and those who were not current smokers but who responded "yes" to the question, "Have you ever smoked cigarettes?" were classified as ever smokers for those years. For the years 1979 through 1991, ever smoking status was determined by response to the question, "About how old were you when you first tried a cigarette?" The prevalence of ever smoking is the complement of the response "Never tried a cigarette."

‡MTFP high school seniors, aged 17–18 years. Based on response to the question, "Have you ever smoked cigarettes?"

§NHIS, aged 18–19 years. Based on response to the question, "Have you smoked at least 100 cigarettes in your entire life?" Those who had smoked at least 100 cigarettes by the time of the survey were classified as ever smokers.

¶Available information from published sources (USDHEW 1972, 1976, 1979b) do not permit exact comparisons with the 1989 TAPS data.

remained higher among white adolescent males than among black adolescent males. Smoking prevalence gradually increased among white males during the six decades covered by the data. Among black males, prevalence declined between 1950 and 1980.

Among female adolescents, the reconstructed prevalence of current smoking increased steadily from 1920 through 1980; in 1980, the prevalence among females surpassed that among males for the first time during the six-decade study period. Prevalence among white females has been higher than among black females since 1950. The data indicate a sharp increase in female smoking prevalence between 1970 and 1980.

Trends in current smoking prevalence over the past two decades indicate that for both males and females, past-month smoking declined sharply in the late 1970s or early 1980s (Table 15). Progress then slowed considerably, especially for males. In the MTFP surveys, the past-month smoking prevalence among males actually increased from 27 percent in 1981 to 29 percent in 1992; in the NHSDA and the NHIS, male smoking prevalence was about the same in 1985 and in 1991. The prevalence among adolescent females in the MTFP and NHIS surveys was only slightly lower in 1991 and 1992 than in 1985; in the 1991 NHSDA, female smoking prevalence was about the same as in 1985. By the early 1980s, smoking was generally more common among females than among males. By 1991, however, adolescent females and males had almost equivalent smoking prevalence.

In all three surveys with information on race, the prevalence of current smoking declined during the late 1970s or early 1980s for both black and white older adolescents (Table 16). In the middle 1970s, current smoking was almost equally common among blacks and whites. At the end of that decade, black adolescents were less likely to be current smokers than white adolescents; this trend continued during the 1980s. Among white high school seniors in the MTFP, current smoking was more prevalent in 1992 (32 percent) than in 1981 (30 percent). In all three surveys, prevalence among older white adolescents was slightly higher in 1991 and 1992 than it was in 1985.

Wallace and Bachman (1991) reported that white high school seniors were more than twice as likely as black high school seniors to report smoking in the past month, even after statistical control was made for factors such as parental education, number of parents living at home, urban or rural location, educational plans, academic performance, and religious attitudes and practices.

MTFP trend data are available for daily smoking among racial and ethnic subgroups (Bachman et al. 1991). In general, for Asian, black, white, Hispanic, and American Indian male and female high school seniors, the prevalence of daily smoking declined from 1976–1984. The decline continued at a reduced rate during the late 1980s for most groups and ceased altogether among white males.

Overall, the prevalence of daily smoking among high school seniors was 29 percent in 1976, 21 percent in 1980, and 17 percent in 1992. Among males, the prevalence was 28 percent in 1976, 19 percent in 1980, and 17 percent in 1992; among females, 29 percent smoked daily in 1976, 24 percent in 1980, and 17 percent in 1992. Among whites, the prevalence of daily smoking declined from 29 percent in 1976 to 22 percent in 1980; the prevalence was 20 percent in 1992. Among blacks, the prevalence of daily smoking declined from 27 percent in 1976 to 16 percent in 1980 and continued to decline to 4 percent in 1992 (Bachman, Johnston, O'Malley 1980a, 1981; ISR, University of Michigan, unpublished data).

Data on smoking among the nation's high school seniors have also been reported as a function of parental education (NCHS 1993). Interestingly, the prevalence of past-month smoking decreased slightly from 1980 through 1991 among those seniors whose parents had completed fewer years of formal education and increased slightly during that period among those seniors whose parents had relatively more years of formal education. For example, among those seniors whose parents, on average, did not graduate from high school, the prevalence of past-month smoking decreased from 33 percent in 1980 to 31 percent in 1991; among seniors whose parents graduated from high school, prevalence of smoking was 34 percent in 1980 and 29 percent in 1991. Among seniors whose parents had some postgraduate education, the prevalence of smoking was 24 percent in 1980 and 27 percent in 1991.

Age or Grade When Smoking Begins

The age at which people become regular cigarette smokers has been measured in national surveys conducted in 1955, 1966, 1970, 1978, 1979, 1980, 1987, and 1988 (Haenszel, Shimkin, Miller 1955; NCHS 1970; USDHHS 1980, 1989b, 1991b; CDC 1991b). Data from the 1955 Current Population Survey (Haenszel, Shimkin, Miller 1955) suggest that during the first half of the century, people became regular smokers at progressively younger ages. The data for males are limited, however, because before 1974 many of the reports for men were provided by proxy respondents.

To reduce proxy responses, Ahmed and Gleeson (NCHS 1970) limited their analysis of data from the 1966 Current Population Survey to females. These investigators concluded that between 1955 and 1966, U. S. women began smoking at an earlier age.

For the present report, the likelihood of having become a regular cigarette smoker by age 18 was determined for females surveyed in the 1970, 1978–1980, and

Table 15. Trends in the prevalence (%) of current smoking* among young people, by gender, National Teenage Tobacco Surveys (NTTS), National Household Surveys on Drug Abuse (NHSDA), Monitoring the Future Project (MTFP), National Health Interview Surveys (NHIS), United States, 1968–1992

	NTTS		NHSDA		MTFP		NHIS	
Year	Males (aged 17–18 years)	Females (aged 17–18 years)	Males (aged 17–19 years)	Females (aged 17–19 years)	Males (aged 17–18 years)	Females (aged 17–18 years)	Males (aged 18–19 years)	Females (aged 18–19 years)
1968	34.0	21.0						
1970	37.8	24.1						
1972	31.2	26.0						
1974	32.6	26.4	47.8	38.7			36.9	30.8
1976			35.1	52.0	37.7	39.1		
1977			39.0	47.2	36.7	39.7		
1978					34.5	38.1	30.6	33.5
1979	19.6	27.0	41.7†	41.7†	31.2	37.1	29.5	34.2
1980					26.8	33.4	24.9	27.8
1981					26.5	31.6		
1982			35.6	37.3	26.8	32.6		
1983					28.0	31.6	23.3	31.4
1984					25.9	31.9		
1985			27.8	26.7	28.2	31.4	20.1	24.5
1986					27.9	30.6		
1987					27.0	31.4	21.6	20.9
1988			28.3	32.9	28.0	28.9	19.6	23.1
1989					27.7	29.0		
1990			28.9	20.2	29.1	29.2	21.7	18.0
1991			27.0	27.0	29.0	27.5	22.0	20.6
1992					29.2	26.1		

Sources: **NTTS**: U.S. Department of Health, Education, and Welfare (USDHEW) (1972, 1976, 1979b); **NHSDA**: Centers for Disease Control and Prevention (CDC), Office on Smoking and Health (OSH) (unpublished data on 1974–1991 surveys); **MTFP**: Bachman, Johnston, O'Malley (1980a, b, 1981, 1984, 1985, 1987, 1991); Johnston, Bachman, O'Malley (1980a, b, 1982, 1984, 1986, 1991, 1992); Johnston, O'Malley, Bachman (1991a, in press); Institute for Social Research, University of Michigan (unpublished data); **NHIS**: CDC, OSH (unpublished data in 1974–1991 surveys).

*For the NTTS, current smokers are those who state that they smoke less than one cigarette per week, one or more cigarettes per week, or one or more cigarettes a day (USDHEW 1979b). For the NHSDA and the MTFP, current smoking is defined as any cigarette smoking during the 30 days preceding the survey. For the NHIS, current smokers are those who report that they have smoked at least 100 cigarettes and who respond "yes" to the question, "Do you smoke now?"

†The 1979 NHSDA determined current smoking status only for those respondents who had smoked at least 100 cigarettes (lifetime). The National Institute on Drug Abuse later published adjusted 1979 estimates using data from the 1982 NHSDA (Miller et al. 1983). The adjusted 1979 estimates used the ratio of the 1982 prevalence estimate, based on the 1979 definition, to the prevalence estimate based on the definition used in other years (i.e., any smoking in the last 30 days, regardless of whether the respondent had ever smoked 100 lifetime cigarettes). This table reports estimates based on the same adjustment procedure.

‡Available information from published sources (USDHEW 1972, 1976, 1979b) does not permit exact comparisons with the 1989 TAPS data.

Table 16. Trends in the prevalence (%) of current smoking* among white and black young people, National Household Surveys on Drug Abuse (NHSDA), Monitoring the Future Project (MTFP), National Health Interview Surveys (NHIS), United States, 1974–1992

	NHSDA†		MTFP		NHIS	
Year	White (aged 17–19 years)	Black (aged 17–19 years)	White (aged 17–18 years)	Black (aged 17–18 years)	White (aged 18–19 years)	Black (aged 18–19 years)
1974	41.9	47.4			33.6	33.7
1976	43.0	47.2	38.3	39.7		
1977	42.9	44.3	38.4	34.4		
1978			37.0	31.5	33.3	26.3
1979	44.4‡	37.7‡	34.9	28.7	32.6	30.8
1980			31.0	25.2	26.1	29.0
1981			30.1	22.3		
1982	39.2	20.9	31.3	21.2		
1983			31.3	21.2	28.6	18.5
1984			31.0	17.6		
1985	28.6	20.8	31.7	18.7	23.4	18.4
1986			32.0	14.6		
1987			32.2	13.9	23.4	15.3
1988	33.0	17.6	32.3	12.8	23.7	9.4
1989			32.1	12.4		
1990	28.3	7.2	32.5	12.0	22.2	10.3
1991	30.5	11.4	31.8	9.4	24.9	7.6
1992			31.8	8.2		

Sources: **NTTS**: U.S. Department of Health, Education, and Welfare (1972, 1976, 1979b); **NHSDA**: Centers for Disease Control and Prevention (CDC), Office on Smoking and Health (OSH) (unpublished data on 1974–1991 surveys); **MTFP**: Bachman, Johnston, O'Malley (1980a, b, 1981, 1984, 1985, 1987, 1991); Johnston, Bachman, O'Malley (1980a, b, 1982, 1984, 1986, 1991, 1992); Johnston, O'Malley, Bachman (1992a); Institute for Social Research, University of Michigan (unpublished data); **NHIS**: CDC, OSH (unpublished data on 1974–1991 surveys).

*For the NHSDA and the MTFP, current smoking is defined as any cigarette smoking during the 30 days preceding the survey. For the NHIS, current smokers are those who report that they have smoked at least 100 cigarettes and who respond "yes" to the question, "Do you smoke now?"

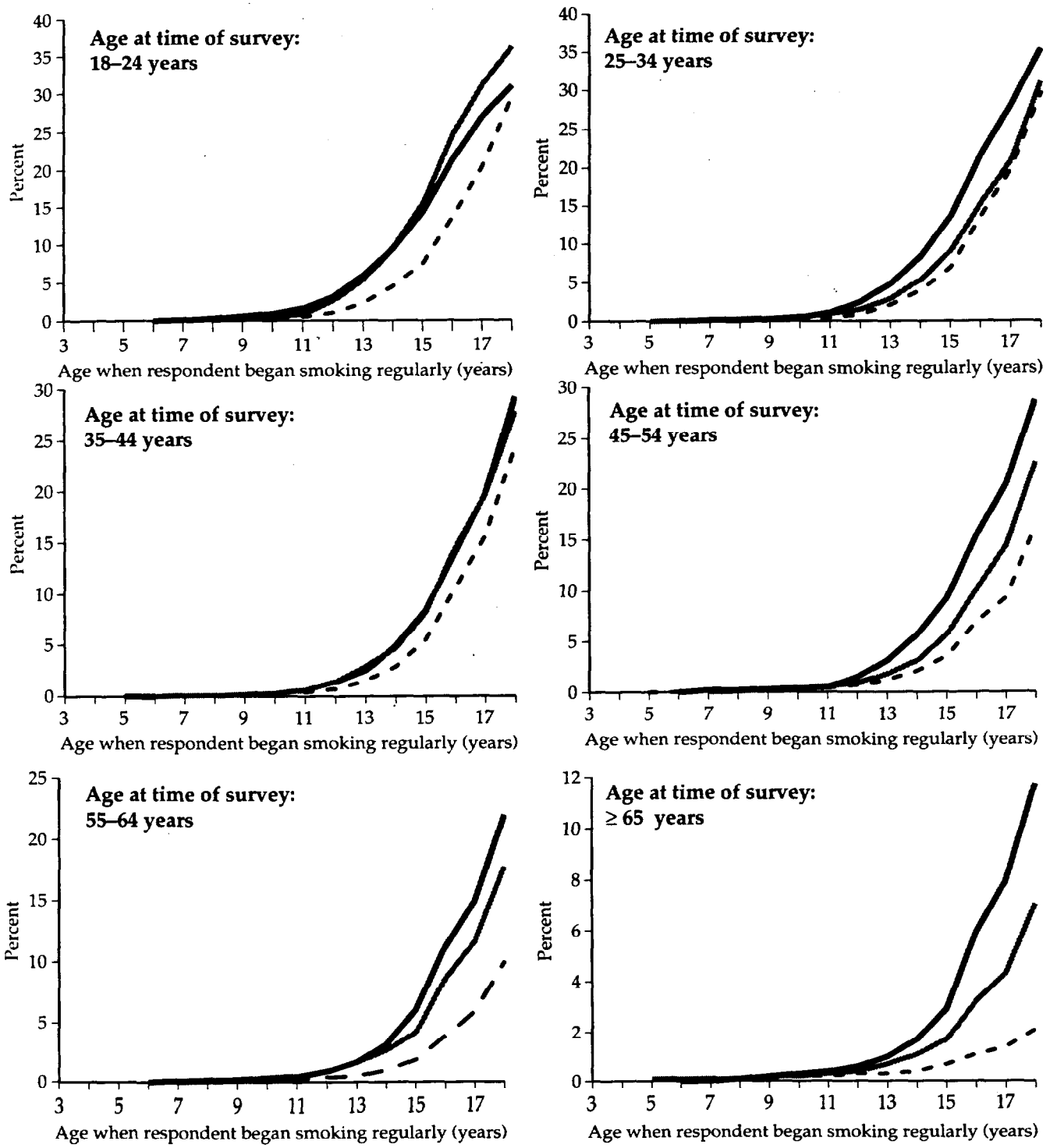
†In the NHSDA, "white" and "black" include respondents of Hispanic origin, except for 1985.

‡The 1979 NHSDA determined current smoking status only for those respondents who had smoked at least 100 cigarettes (lifetime). The National Institute on Drug Abuse later published adjusted 1979 estimates using data from the 1982 NHSDA (Miller et al. 1983). The adjusted 1979 estimates used the ratio of the 1982 prevalence estimate, based on the 1979 definition, to the prevalence estimate based on the definition used in other years (i.e., any smoking in the last 30 days, regardless of whether the respondent had ever smoked 100 lifetime cigarettes). This table reports estimates based on the same adjustment procedure.

1987–1988 NHIS (Figure 2). The data confirm that women in the United States have started to smoke at increasingly younger ages. The largest differences exist for women who were at least 45 years old at the time of the survey. The initiation curve for 18- through 24-year-old females surveyed in 1987 and 1988 is, by age 18, lower than that for 18- through 24-year-old females surveyed in 1978 through 1980, which is consistent with the notion that the prevalence of cigarette smoking has declined recently among young females (Table 15).

Johnston, O'Malley, and Bachman (1992a) used retrospective reports from MTFP high school seniors to describe trends in the initiation of daily smoking among seniors. Their data show that the likelihood of becoming a daily smoker at an earlier grade level increased sharply during the early to middle 1970s for the 1976 through 1978 senior classes. From 1975 through 1977, this likelihood decreased, and the grade of initiation declined or leveled for the 1979–1986 and 1988 classes. The lifetime

Figure 2. Cumulative percentage of females becoming regular cigarette smokers by age 18, by age at time of survey, United States, 1970, 1978–1980, and 1987–1988



Source: National Health Interview Surveys 1970, 1978, 1979, 1980, 1987, 1988, Centers for Disease Control and Prevention, Office on Smoking and Health (unpublished data).

prevalence of daily cigarette smoking at all grade levels increased among the classes of 1989, 1990, and 1991.

Number of Cigarettes Smoked Each Day

Trends in the intensity of smoking among MTFP high school seniors indicate that since 1976, the proportion of heavy smokers (≥ one-half pack per day) has decreased and the proportion of never smokers has increased (Figure 3). For example, in 1976, 25 percent of high school seniors had never smoked, and 19 percent were heavy smokers; by 1992, 38 percent had never smoked, and 10 percent were heavy smokers (Bachman, Johnston, O'Malley 1980a; ISR, University of Michigan, unpublished data).

Attempts to Quit Smoking

Cessation attempts are common among young smokers. In the 1989 TAPS, 74 percent of 12- through 18-year-old smokers reported that they had seriously thought about quitting, 64 percent reported that they had tried to quit smoking, and 49 percent reported that they had tried to quit during the previous six months (Allen et al. 1993).

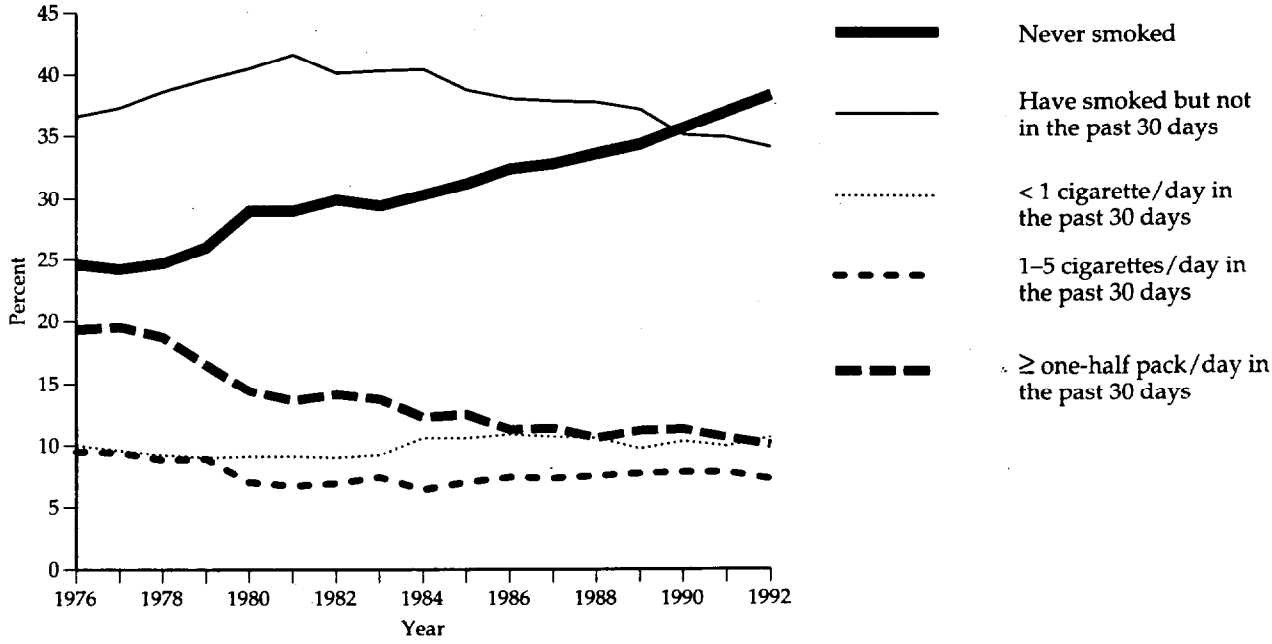
Nearly half of all smokers among high school seniors surveyed by the MTFP between 1976 and 1984 reported that they wanted to stop smoking (Table 17). Interest in quitting declined slightly thereafter. About 30 percent of current smokers reported that at one time in their lives they had tried but failed to stop smoking. About 40 percent of daily smokers reported that they had tried at least once to stop smoking but had failed. The percentage of seniors who at some time had smoked regularly but had not smoked during the 30 days preceding the survey (former smokers) increased sharply for males from 1977 through 1980 and for females from 1977 through 1981 (Figure 4). This measure declined sharply after 1980 for males and after 1981 for females.

Table 17. Trends in high school senior smokers' interest in quitting smoking and attempts to quit smoking, by frequency of smoking during the past 30 days, Monitoring the Future Project, United States, 1976–1989

	Respondents answering "Yes"					
	1976–1979		1980–1984		1985–1989	
Survey Question	N (weighted)	%	N (weighted)	%	N (weighted)	%
Do you want to stop smoking now?						
Among those who smoked at all during the last 30 days	3,872	46.1	3,805	47.1	3,418	42.5
Among those who smoked ≥ 1 cigarette/day during the last 30 days	3,396	46.1	3,262	47.6	2,761	43.9
Have you ever tried to stop smoking and found that you could not?						
Among those who smoked at all during the last 30 days	4,740	31.5	4,942	31.4	4,534	27.8
Among those who smoked ≥ 1 cigarette/day during the last 30 days	3,604	38.5	3,464	41.6	2,953	39.4

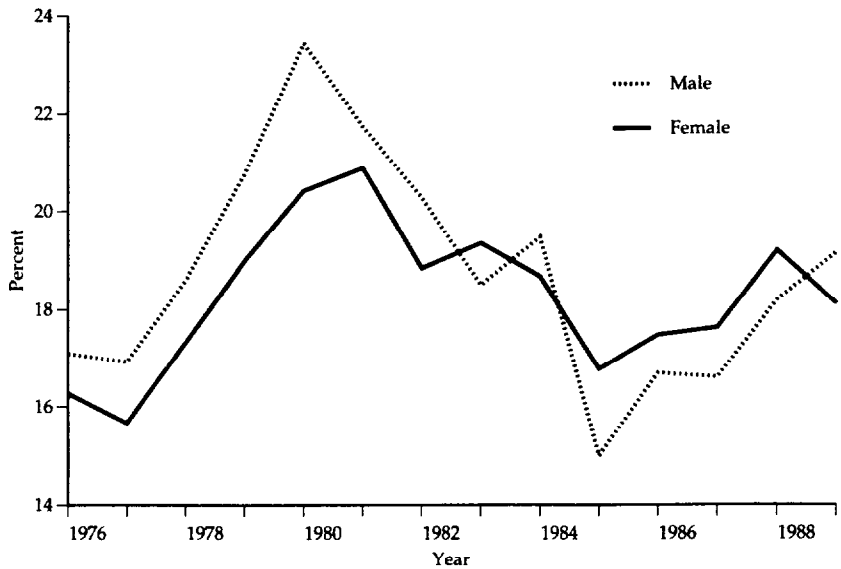
Source: Centers for Disease Control and Prevention, Office on Smoking and Health (unpublished data).

Figure 3. Trends in the intensity of smoking among high school seniors, Monitoring the Future Project, United States, 1976–1992



Sources: Bachman, Johnston, O'Malley (1980a, b, 1981, 1984, 1985, 1987, 1991); Johnston, Bachman, O'Malley (1980a, b, 1982, 1984, 1986, 1991, 1992); Institute for Social Research, University of Michigan (unpublished data).

Figure 4. Trends in the percentage of former smokers among ever smokers,* by gender, high school seniors, Monitoring the Future Project, United States, 1976–1989



Source: Centers for Disease Control and Prevention, Office on Smoking and Health (unpublished data).
*Percentage of those who had ever smoked regularly who had not smoked during the previous 30 days.

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The trend of cessation is similar to the trend for current smoking prevalence. Substantial progress occurred in the late 1970s, but this progress slowed considerably in the 1980s.

Trends in Knowledge and Attitudes About Smoking

Trends in Perceived Health Risks of Smoking

Data from the MTFP allow comparisons of trends in beliefs about the risks associated with cigarette smoking and in actual smoking behavior. The decline in the prevalence of ever smoking has been associated with an increase in the percentage of high school seniors who believe that smoking one or more packs of cigarettes each day is a serious health risk (Figure 5). This association has been observed for both genders and for whites and blacks (Bachman, Johnston, O'Malley 1980a, b, 1981, 1984, 1985, 1987, 1991; Johnston, Bachman, O'Malley 1980a, b, 1982, 1984, 1986, 1991; ISR, University of Michigan, unpublished data). For example, during the early 1980s, the percentage of black high school seniors who felt that there is great risk associated with smoking a pack or more per day increased substantially. At the same time, the percentage of black youth who had smoked at all and who had smoked daily declined rapidly. In 1989, over 50 percent of smokers and 74 percent of nonsmokers reported that they believed that smoking a pack or more per day is a serious health risk (1989 MTFP, CDC, OSH, unpublished data).

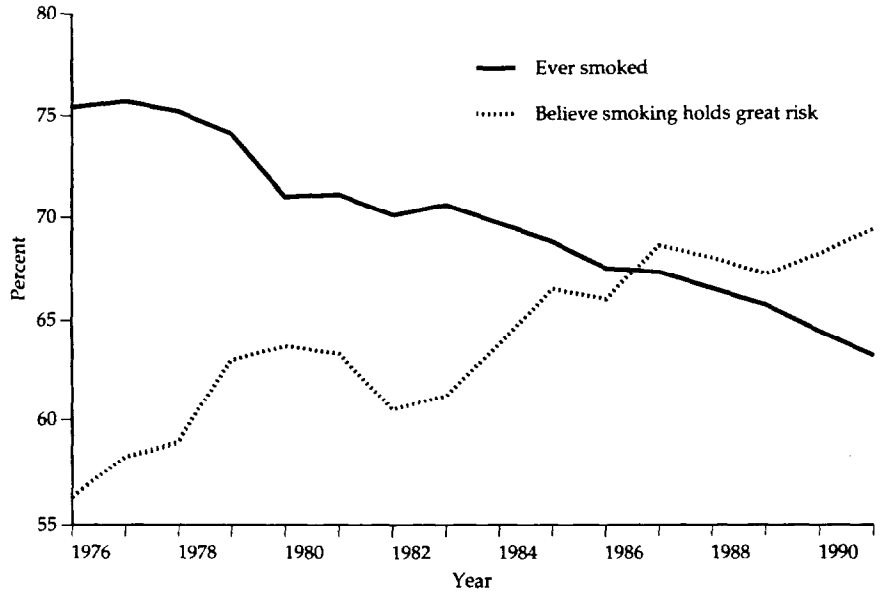
The percentage of seniors who believed that smoking entails a great risk to health increased from 56 percent in 1976 to 69 percent in 1991, and the percentage who believed that the health effects of smoking had been exaggerated decreased from 16 percent in 1981 to 14 percent in 1991 (Table 18). Nonetheless, 3 out of 10 seniors in 1991 still did not believe that heavy smoking poses a serious threat to health.

Among 12- through 18-year-olds in the 1989 TAPS, 32 percent believed that there is no harm in having an occasional cigarette; 57 percent of smokers in the survey endorsed that statement (Allen et al. 1993). Twenty-one percent of smokers and 3 percent of never smokers believed that it is safe to smoke for only a year or two.

Trends in Perceptions About Smoking

The percentage of high school seniors surveyed by the MTFP who considered smoking a "dirty habit" increased between 1981 (66 percent) and 1991 (72 percent) (Table 18). About 73 percent of white and 74 percent of black adolescents now feel this way, compared with only

Figure 5. Trends in the percentage of high school seniors who believe that smoking is a serious health risk and in the percentage who have ever smoked, Monitoring the Future Project, United States, 1976–1991



Sources: Bachman, Johnston, O'Malley (1980a, b, 1981, 1984, 1985, 1987, 1991); Johnston, Bachman, O'Malley (1980a, b, 1982, 1984, 1986, 1991, 1992); Institute for Social Research, University of Michigan (unpublished data).

69 percent of whites and 54 percent of blacks surveyed in 1981 (Johnston, Bachman, O'Malley 1982; ISR, University of Michigan, unpublished data). The perception that smoking is a dirty habit has increased among males, females, smokers, and nonsmokers. Fifty percent of smokers and 81 percent of nonsmokers classified smoking as a dirty habit in 1989 (Johnston, Bachman, O'Malley 1982, 1984, 1986, 1991, 1992; Bachman, Johnston, O'Malley 1984, 1985, 1991; 1981–1989 MTFP, CDC, OSH, unpublished data).

Between 1977 and 1981, the percentage of seniors who felt that their close friends would not, or did not, approve of their smoking increased substantially (Table 18). The percentages reported for 1981 and 1991, however, were essentially identical. The percentage of seniors who believed that adults should be prohibited by law from smoking in certain public places increased from 42 percent in 1977 to 45 percent in 1986 and remained about the same in 1991.

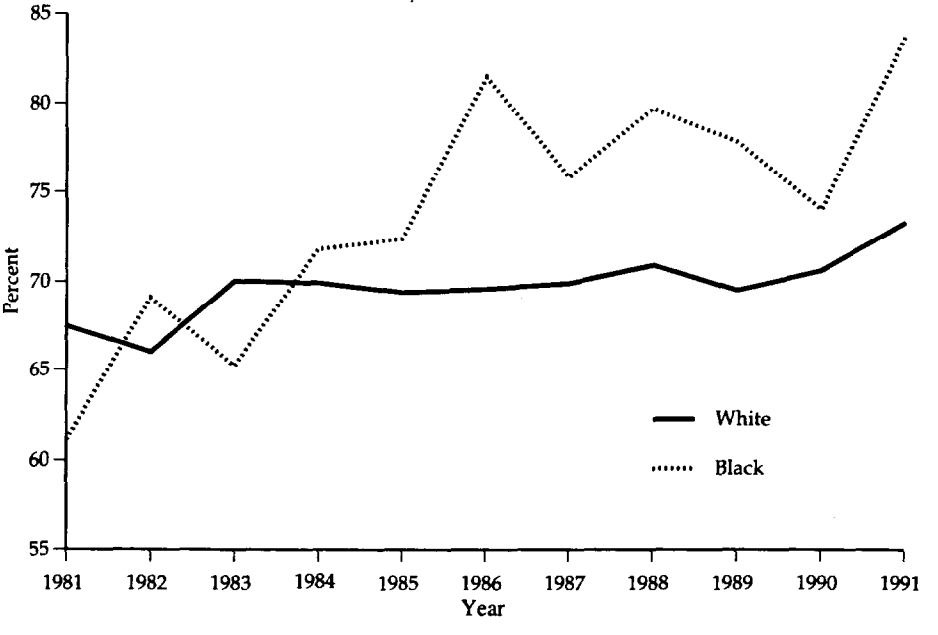
TAPS data on 12- through 18-year-olds provide further information on beliefs about smoking. In 1989, smokers were from two to five times more likely than never smokers to report that they believed that cigarette smoking helps people relax, reduce stress, feel more comfortable in social situations, reduce boredom, and keep their weight down (Allen et al. 1993). Smokers may also deny the addictive properties of cigarettes (USDHHS 1988b). TAPS data indicated that 39 percent of smokers—but only 11 percent of never smokers—believed that they would be able to quit smoking anytime they wanted.

Trends in Perceptions About Smokers

The overwhelming majority of high school seniors surveyed by the MTFP did not believe that cigarette smoking makes smokers their age look mature, in control, or independent (Table 18). About half believed that smoking makes smokers look insecure, and more than 60 percent perceived cigarette smoking as something smokers use to try to look mature. Between 1981 and 1991, smoking among seniors became less of the behavioral norm; fewer than 20 percent of seniors in 1991 reported feeling that smoking is an attempt to conform to such a norm.

Responses to the MTFP indicate that the majority of high school seniors prefer to date nonsmokers and that this is becoming a trend. Since 1981, the proportion of respondents who prefer to date nonsmokers has increased by over 10 percent, to about 74 percent. The most substantial change occurred among black high school seniors (Figure 6). The percentage of white seniors who preferred to date nonsmokers increased only slightly. Over 85 percent of nonsmokers and

Figure 6. Trends in the percentage of high school seniors who prefer to date nonsmokers, by race, Monitoring the Future Project, United States, 1981–1991



Sources: Bachman, Johnston, O'Malley (1981, 1984, 1985, 1987, 1991); Johnston, Bachman, O'Malley (1982, 1984, 1986, 1991, 1992); Institute for Social Research, University of Michigan (unpublished data).

Table 18. Trends in high school seniors' beliefs and attitudes about smoking and smokers, Monitoring the Future Project, United States, 1976, 1981, 1986, 1991

Beliefs and attitudes	1976	1981	1986	1991
About smoking				
How much do you think people risk harming themselves if they smoke one or more packs of cigarettes per day?* (percentage who say great risk)	56.4	63.3	66.0	69.4
The harmful effects of cigarettes have been exaggerated.† (percentage who agree)		15.5	16.2	13.8
Smoking is a dirty habit. (percentage who agree)		65.5	68.6	71.6
How do you think your close friends feel (or would feel) about your smoking one or more packs of cigarettes per day?‡ (percentage who disapprove)	60.0§	73.9	76.2	74.3
Do you think that people (who are 18 or older) should be prohibited by law from smoking tobacco in certain specified public places? (percentage who say yes)	42.0§	43.0	45.1	44.9
About smokers				
In my opinion, when a guy my age is smoking a cigarette, it makes him look (percentage who agree)				
. . . like he's trying to appear mature and sophisticated		61.4	62.7	60.8
. . . insecure		42.0	43.6	47.9
. . . conforming		25.4	21.3	16.5
. . . rugged, tough, independent		8.6	9.9	9.8
. . . mature, sophisticated		5.3	4.6	5.0
. . . cool, calm, in control		6.2	5.5	5.3

Sources: Bachman, Johnston, O'Malley (1980a, 1987); Johnston, Bachman, O'Malley (1980a, 1982); Institute for Social Research, University of Michigan (unpublished data).

*Possible responses included "no risk," "slight risk," "moderate risk," "great risk," "can't say—drug unfamiliar." Percentages include those who say "great risk."

†Possible responses included "disagree," "mostly disagree," "neither," "mostly agree," "agree." Percentages include those who "agree" or "mostly agree."

‡Possible responses included "not disapprove," "disapprove," "strongly disapprove." Percentages include those who "disapprove" or "strongly disapprove."

§1977 data.

Table 18. Continued

Beliefs and attitudes	1976	1981	1986	1991
About smokers				
In my opinion, when a girl my age is smoking a cigarette, it makes her look (percentage who agree)				
. . . like she's trying to appear mature and sophisticated		64.6	65.0	64.1
. . . insecure		47.4	49.5	52.0
. . . conforming		26.5	21.7	19.5
. . . independent and liberated		11.2	9.5	9.6
. . . mature, sophisticated		6.9	5.4	4.5
. . . cool, calm, in control		5.5	4.5	4.1
I prefer to date people who don't smoke. (percentage who agree)		66.5	71.0	74.0
Smokers know how to enjoy life more than nonsmokers. (percentage who agree)		2.8	2.4	3.6
I think that becoming a smoker reflects poor judgment. (percentage who agree)		57.0	59.3	61.0
I strongly dislike being near people who are smoking. (percentage who agree)			45.4	48.9
I personally don't mind being around people who are smoking. (percentage who agree)		38.2	36.9	33.1
Do you disapprove of people (≥ age 18) who smoke one or more packs of cigarettes per day? (percentage who disapprove)	65.9	70.0	75.4	71.4

about one-third of smokers preferred to date nonsmokers in 1989 (1989 MTFP, CDC, OSH, unpublished data).

Findings from the 1989 TAPS also suggest that few adolescents consider smoking a norm for their age group. Two-thirds of 12- through 18-year-old respondents agreed with the statement, "Seeing someone smoking turns me off," and 86 percent (94 percent of never smokers and 51 percent of current smokers) preferred to date nonsmokers (Allen et al. 1993).

Adolescents seem to be more concerned about people smoking around them. In the MTFP, the percentage of high school seniors who strongly disliked being near smokers increased between 1986 (45 percent) and 1991 (49 percent), and the percentage who reported that they did not mind being around smokers declined (from 38 percent in 1981 to 33 percent in 1991) (Table 18). Males were consistently more likely than females to mind being around smokers (Johnston, Bachman, O'Malley 1982,

1984, 1986, 1991, 1992; Bachman, Johnston, O'Malley 1984, 1985, 1991; ISR, University of Michigan, unpublished data). The percentage of female seniors who did not mind being around smokers changed little over time. From 1981 through 1991, the proportion of high school seniors who did not mind being around people who were smoking decreased by about 50 percent among blacks and by only 5 percent among whites (Figure 7). Smokers' acceptance of being around other smokers remained constant, at approximately 70 percent, from 1981 through 1989, whereas the percentage of nonsmokers who did not mind being around smokers decreased from 25 to 21 percent (1981–1989 MTFP surveys, CDC, OSH, unpublished data).

Adult Implications of Adolescent Smoking

Some notable findings regarding young people's expectations to smoke, or to abstain from smoking, have emerged from the MTFP (see Johnston, O'Malley, Bachman 1992b). In their senior year, respondents who answered one of five questionnaire forms were asked, "Do you think you will be smoking cigarettes five years from now?" Overall, about 1 percent said they "definitely" would be smoking in five years, 14 percent said they "probably" would, 27 percent said they probably would not, and 58 percent said they definitely would not (Table 19). About 55 percent of past-month smokers and about 45 percent of daily smokers stated that they probably would not or definitely would not be smoking in five years.

Of the seniors in the full panel, 68 percent indicated that they had not smoked in the 30 days preceding the senior-year survey; 9 percent had smoked less than one cigarette per day; 8 percent had smoked one to five cigarettes per day; 7 percent had smoked about one-half pack per day; and 8 percent had smoked a pack or more per day (Table 20). Five years after graduation, the same total proportion (32 percent) were past-month smokers. Somewhat more (26 vs. 23 percent), however, were daily smokers. Further, for each smoking group defined by senior-year smoking level, those who continued to smoke increased their frequency of smoking (Tables 20–21).

Of the respondents who were nonsmokers at the end of their senior year, 86 percent remained nonsmokers five to six years later, whereas only 13 percent of those who smoked one pack each day in their senior year became nonsmokers (Table 20). Those students who smoked one-half pack per day in their senior year were nearly as likely to continue use as were those students who smoked one pack daily; 81 percent of half-pack-a-day smokers still smoked, and the majority of them increased their rate of smoking (Table 21). Seventy percent of respondents who in their senior year smoked one to five cigarettes per day continued to smoke five years later; most of these continuing smokers increased their rate of use. Even among the seniors who smoked the least (less than one cigarette per day), 42 percent continued to smoke five to six years later, and two-thirds of these had increased their rate of smoking.

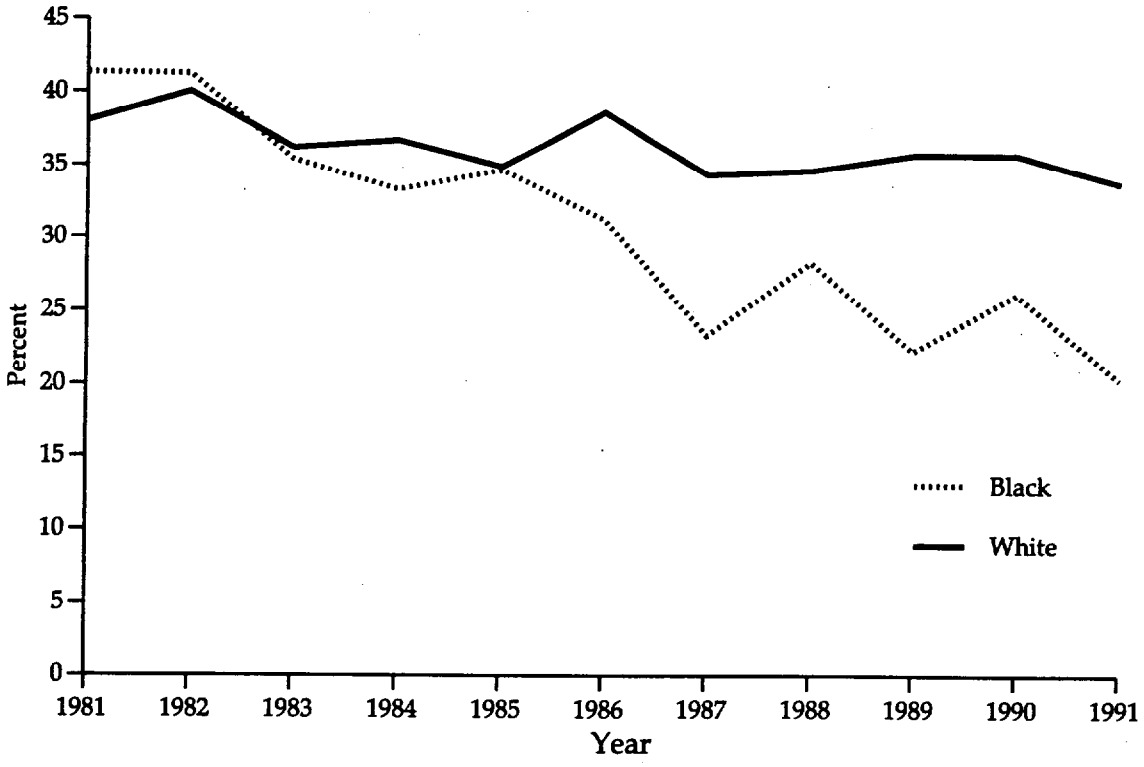
When earlier smoking behavior is controlled, seniors' expectations to smoke had very limited power to predict subsequent smoking behavior (Table 22). Many seniors who smoked one pack per day had expectations of discontinuing use. These expectations showed no relationship to the actual rate of smoking five to six years later. The same is true for those seniors who smoked

Table 19. High school seniors predicting whether they will be smoking in five years, by smoking status in senior year, Monitoring the Future Project, United States, 1976–1986 senior classes

	Predicted likelihood of smoking in five years (%)*				
Senior year smoking status (use in past 30 days)	**Definitely will**	**Probably will**	**Probably will not**	**Definitely will not**	**Number (weighted)**
None	0.4	1.3	21.0	77.3	1,926
< 1 cigarette/day	0.5	14.7	56.5	28.3	248
1–5 cigarettes/day	1.8	37.6	44.1	16.5	211
About ½ pack/day	0.6	57.7	30.3	11.3	197
≥ 1 pack/day	5.1	62.9	26.7	5.2	228
Total	0.9	14.2	27.0	58.0	2,810

Source: Institute for Social Research, University of Michigan (unpublished data).
*Entries are row percentages.

Figure 7. Trends in the percentage of high school seniors who do not mind being around people who are smoking, by race, Monitoring the Future Project, United States, 1981–1991



Sources: Bachman, Johnston, O'Malley (1981, 1984, 1985, 1987, 1991); Johnston, Bachman, O'Malley (1982, 1984, 1986, 1988, 1991,1992); Institute for Social Research, University of Michigan (unpublished data).

Table 20. Intensity of smoking (%) in senior year of high school, by intensity of smoking 5–6 years later, Monitoring the Future Project, United States, 1976–1986

	Smoking intensity (past 30 days) 5–6 years later (%)*						
Senior-year smoking intensity (use in past 30 days)	**None**	**< 1 cigarette /day**	**1–5 cigarettes /day**	**½ pack**	**≥ 1 pack**	**Number (weighted)**	**Column percentage**
None	85.6	4.9	2.6	2.7	4.1	9,238	67.6
< 1 cigarette/day	57.8	14.4	9.6	7.8	10.4	1,268	9.3
1–5 cigaretes per day	29.6	8.8	17.2	20.5	23.9	1,058	7.7
About ½ pack/day	18.8	4.9	8.7	21.7	46.0	1,000	7.3
≥ 1 pack/day	13.4	2.7	4.1	10.1	69.7	1,100	8.1
Total	68.0	5.9	5.0	6.6	14.6	13,665	100.0

Source: Institute for Social Research, University of Michigan (unpublished data).
*Entries are row percentages.

Table 21. Direction of change in smoking behavior (%) between senior year of high school and 5–6 years later, Monitoring the Future Project, United States, 1976–1986 senior classes

Senior-year smoking status (use in past 30 days)	Smoking status 5–6 years later*				
	Quit	Less use	Same level	More use	Number (weighted)
None			85.6	14.4	9,238
< 1 cigarette/day	57.8		14.4	27.8	1,268
1–5 cigarettes/day	29.6	8.8	17.2	44.4	1,058
About ½ pack/day	18.8	13.6	21.7	46.0	1,000
≥ 1 pack/day	13.2	17.7	40.2	29.0	869

Source: Institute for Social Research, University of Michigan (unpublished data).
*Entries are row percentages.

Table 22. Smoking intensity 5–6 years after high school, by senior-year smoking status and expectation to smoke in 5 years, Monitoring the Future Project, United States, 1976–1986 senior classes

Senior-year smoking intensity (use in past 30 days) and predicted likelihood of smoking in 5 years	Smoking intensity (past 30 days) 5–6 years later*					
	None	< 1 cigarette /day	1–5 cigarettes /day	1/2 pack/day	≥ 1 pack /day	Number (weighted)
None						
Will smoke	55.3	10.6	19.8	8.3	5.9	30
Will not smoke	84.7	5.6	2.9	2.5	4.3	1,829
Total	84.2	5.7	3.2	2.6	4.3	1,859
< 1 cigarette/day						
Will smoke	41.7	18.4	19.5	14.0	6.4	36
Will not smoke	58.4	14.7	9.7	9.7	7.5	208
Total	55.9	15.2	11.1	10.4	7.3	244
1–5 cigarettes/day						
Will smoke	32.3	3.0	15.5	23.0	26.2	83
Will not smoke	31.8	5.8	15.9	23.0	23.5	125
Total	32.0	4.7	15.7	23.0	24.6	208
About 1/2 pack/day						
Will smoke	15.5	4.9	6.5	21.0	52.1	115
Will not smoke	17.6	2.5	6.5	21.1	52.3	81
Total	16.4	3.9	6.5	21.1	52.2	196
≥ 1 pack/day						
Will smoke	13.3	2.2	3.2	9.6	71.8	153
Will not smoke	13.2	1.6	5.3	6.3	73.6	72
Total	13.3	2.0	3.8	8.5	72.4	225
Grand Total	67.0	6.0	5.2	6.6	15.2	2,731

Source: Institute for Social Research, University of Michigan (unpublished data).
*Entries are row percentages.

one-half pack—or even as little as one to five cigarettes—per day in high school. Expectations were predictive only for those smokers who smoked less than one cigarette per day; 58 percent of those who thought they probably or definitely would be smoking in the future did, in fact, continue to smoke, whereas only 42 percent of those who did not expect to smoke in the future did smoke. Among seniors who had never smoked, less than 2 percent thought they would be smoking in five years (Table 19). This small group did, in fact, have a higher rate of subsequent smoking (45 percent) than never smokers who did not expect to be smoking in five years (15 percent) (Table 22).

Thus, the expectation to avoid smoking seemed to make some difference among nonsmokers and very light smokers in high school, although very few seniors in these groups reported an expectation to smoke. On the other hand, among light, moderate, and heavy daily smokers, the expectation to abstain from smoking in the future seemed overwhelmed by the strong forces that tend to maintain or advance smoking behavior once it is established. One implication of these results is that young people should be made aware of the strongly addictive nature of nicotine and its ability to overwhelm future good expectations. Clearly, prevention is the major goal, but immediate cessation is of critical importance for adolescents, even for those who smoke very little in high school.

Smoking and Other Drug Use

In Chapter 2, tobacco use is discussed as a possible predictor of other drug use (see "Smoking as a Risk Factor for Other Drug Use" and "Smokeless Tobacco Use as a Risk Factor for Other Drug Use"). The present chapter presents detailed information on high school seniors' usage patterns for cigarettes, alcohol, marijuana, cocaine, inhalants, and smokeless tobacco. Both prevalence of past-month use and comparisons of the self-reported age at first use of each will be presented.

Prevalence of Smoking and Other Drug Use

Among high school seniors in the MTFP studies, the majority of alcohol users (60 percent) and smokeless tobacco users (57 percent) did not smoke (Table 23). The majority of marijuana (62 percent), cocaine (68 percent), and inhalant (56 percent) users smoked cigarettes. Cigarette smoking prevalence was from 1.9 to 3.9 times higher among users of these drugs than among nonusers.

Although most drinkers (60 percent) did not smoke, almost all smokers (88 percent) were drinkers. Almost one-half (45 percent) of cigarette smokers were also marijuana smokers, 11 percent were cocaine users, 5 percent used inhalants, and 33 percent used smokeless tobacco (which will be discussed separately later in this chapter). The prevalence of

Table 23. Prevalence (%) of cigarette smoking among users of other drugs and prevalence of other drug use among smokers,* high school seniors, Monitoring the Future Project, United States, 1985–1989

Other substances	Prevalence of smoking among users of other drugs	Prevalence of smoking among nonusers of other drugs	Prevalence of drug use among smokers	Prevalence of drug use among nonsmokers
Alcohol	40.0	10.3	87.6	54.8
Marijuana	62.1	20.3	44.9	11.2
Cocaine†	68.1	27.2	10.9	2.1
Inhalants‡	56.1	28.5	4.8	1.5
Smokeless tobacco§	43.0	22.4	32.5	15.6

Source: Centers for Disease Control and Prevention, Office on Smoking and Health (unpublished data).

*Any use of cigarettes or other drugs during the past month.

†Includes "coke," "crack," and "rock."

‡Glue, aerosols, laughing gas, etc.

§Males only, 1986–1989 senior classes only.

other drug use was from 1.6 to 5.2 times more prevalent among cigarette smokers than nonsmokers.

Grade When Smoking and Other Drug Use Begins

MTFP data from 1986 through 1989 were merged to observe the grade at which seniors reported trying cigarettes, smokeless tobacco, alcohol, marijuana, and cocaine (Figure 8). Among ever smokers, 31 percent tried their first cigarette by the sixth grade, and 61 percent first smoked by the eighth grade. Among those who had used smokeless tobacco, 23 percent had first done so by the sixth grade, and 53 percent by the eighth grade. Proportionately fewer users of alcohol, marijuana, and cocaine initiated use as early as respondents initiated use of cigarettes and smokeless tobacco. Thirty-four percent of alcohol users, 26 percent of marijuana users, and 6 percent of cocaine users first tried these drugs by the eighth grade.

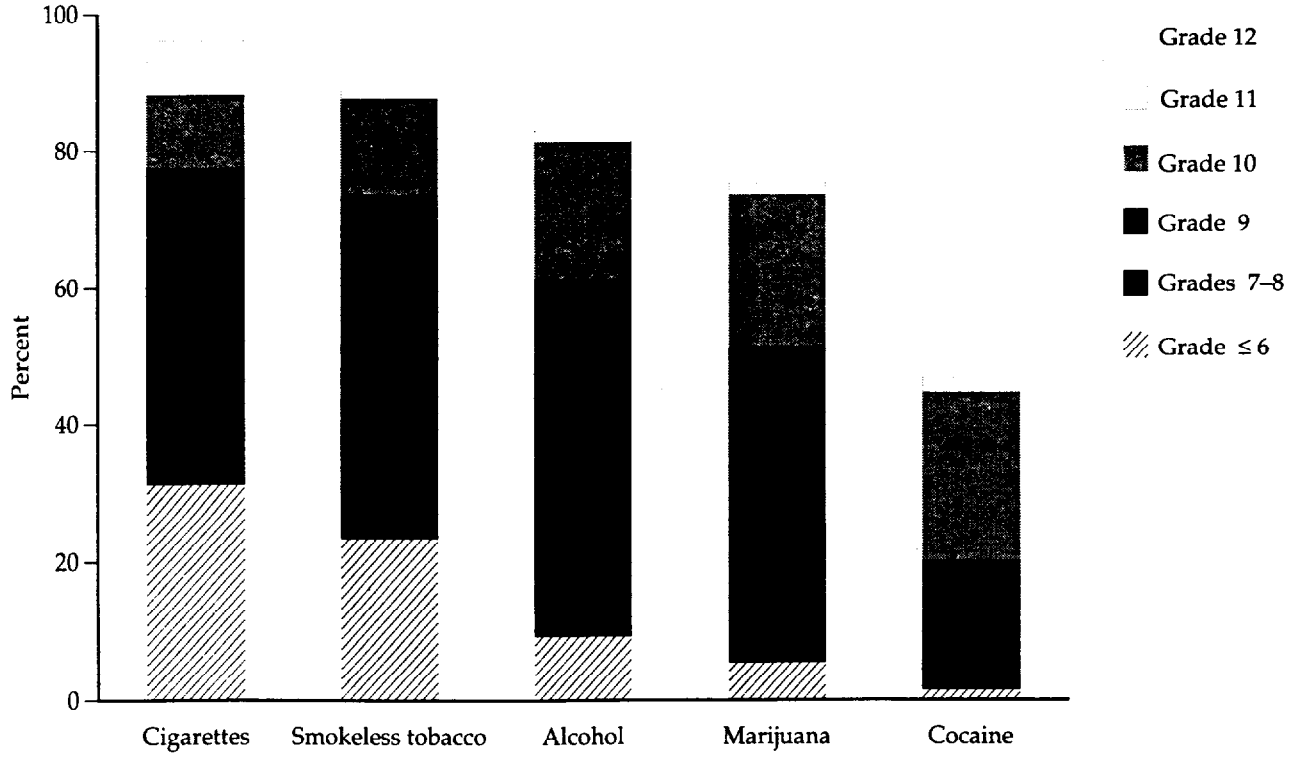
By the 12th grade, only 8 percent of MTFP respondents had not tried cigarettes or alcohol; 68 percent had tried both, and 24 percent had tried alcohol but not cigarettes (Table 24). Of those students who had tried both cigarettes and alcohol by 12th grade, almost half (49 percent) had tried cigarettes before trying alcohol; 33 percent had tried both at about the same time.

About 30 percent of all students had not tried cigarettes or marijuana by the 12th grade (Table 25); 44 percent had tried both, and 22 percent had tried cigarettes but not marijuana. Of those who had tried both by 12th grade, most students (65 percent) had tried cigarettes before marijuana; 23 percent had tried both at about the same time.

About one-third of seniors (34 percent) had not tried cigarettes or cocaine; 12 percent had tried both, and over half (53 percent) had tried cigarettes but not cocaine (Table 26). Of those who had tried both by 12th grade, 90 percent had tried cigarettes before trying cocaine, and 9 percent had tried both at about the same time.

These data support the contention that tobacco use falls early in the sequence of drug use for young adolescents and therefore may be considered a "gateway" drug.

Figure 8. Grade when respondents (high school seniors) first tried cigarettes, smokeless tobacco, alcohol, marijuana, and cocaine, among respondents who had ever used these substances by grade 12, Monitoring the Future Project, United States, 1986–1989



Source: Centers for Disease Control and Prevention, Office on Smoking and Health (unpublished data).

Table 24. Percent distribution of high school seniors (N [weighted] = 19,831), by grade in which they first (if ever) used cigarettes and alcohol, Monitoring the Future Project, United States, 1986–1989

Grade when respondent first tried cigarettes	Grade when respondent first tried alcohol							
	≤ 6	7–8	9	10	11	12	Never used	Row total
≤ 6	4.2	7.2	4.9	2.5	1.5	0.6	0.3	21.2
7–8	1.3	8.0	6.4	3.1	1.3	0.5	0.2	20.8
9	0.4	2.0	4.9	2.4	1.0	0.4	0.1	11.1
10	0.3	1.1	1.9	2.8	1.0	0.3	*	7.4
11	0.2	0.5	1.2	1.6	1.6	0.3	0.1	5.5
12	0.1	0.3	0.5	0.6	0.6	0.6	0.1	2.7
Never used	2.0	3.8	5.3	5.3	4.7	2.8	7.5	31.4

Source: Centers for Disease Control and Prevention, Office on Smoking and Health (unpublished data).

* < 0.05.

Note: Totals may not equal the sum of individual percentages because of rounding.

Table 25. Percent distribution of high school seniors (N [weighted] = 20,657), by grade in which they first (if ever) tried cigarettes and marijuana, Monitoring the Future Project, United States, 1986–1989

Grade when respondent first tried cigarettes	Grade when respondent first tried marijuana							
	≤ 6	7–8	9	10	11	12	Never used	Row total
≤ 6	2.0	4.5	3.3	2.2	1.4	0.8	6.2	20.3
7–8	0.3	4.1	4.4	2.9	1.5	0.8	5.8	19.8
9	0.1	0.5	2.5	2.3	1.2	0.6	3.5	10.7
10	0.1	0.2	0.5	1.7	1.4	0.5	2.6	6.9
11	*	0.1	0.3	0.4	1.3	0.6	2.5	5.2
12	*	*	0.1	0.2	0.2	0.5	1.5	2.6
Never used	0.2	0.5	0.9	0.9	0.9	0.6	30.5	34.5

Source: Centers for Disease Control and Prevention, Office on Smoking and Health (unpublished data).

*< 0.05.

Note: Totals may not equal the sum of individual percentages because of rounding.

Table 26. Percent distribution of high school seniors (N [weighted] = 21,007), by grade in which they first (if ever) used cigarettes and cocaine, Monitoring the Future Project, United States, 1986–1989

Grade when respondent first tried cigarettes	Grade when respondent first tried cocaine							
	≤ 6	7–8	9	10	11	12	Never used	Row total
≤ 6	0.1	0.4	0.9	1.2	1.4	0.9	15.4	20.3
7–8	*	0.2	0.6	1.1	1.3	0.9	15.6	19.7
9	*	*	0.2	0.5	0.6	0.3	9.0	10.7
10	*	*	*	0.2	0.4	0.2	6.1	7.0
11	*	*	*	*	0.2	0.2	4.8	5.2
12	*	*	*	*	*	0.1	2.5	2.6
Never used	*	*	0.1	0.2	0.2	0.3	33.8	34.5

Source: Centers for Disease Control and Prevention, Office on Smoking and Health (unpublished data).
* < 0.05.
Note: Totals may not equal the sum of individual percentages because of rounding.

Table 27. Percentage of high school students who used tobacco, by behaviors that contribute to unintentional and intentional injuries, Youth Risk Behavior Survey, United States, 1991

Risk behavior	Number	Any cigarette use*	Current cigarette use†	Current frequent cigarette use‡	Current smokeless tobacco use§
Seat belt use△					
Always	2,908	60.2	17.8	6.8	13.5
Most the time/sometimes	5,651	70.1	26.3	11.4	17.6
Rarely/never	3,548	80.6	40.3	21.8	26.5
Physical fighting¶					
0 times	6,864	63.9	20.3	8.1	13.9
1–5 times	4,358	77.8	35.4	17.3	23.2
≥ 6 times	789	82.6	49.3	30.5	32.1
Weapon carrying**					
0 days	8,703	65.5	22.6	9.4	13.3
≥ 1 day	3,171	82.8	41.1	22.2	27.5
Attempted suicide¶					
0 times	10,060	68.2	24.8	10.6	17.8
≥ 1 time	824	85.0	52.5	33.8	33.6

Sources: Centers for Disease Control and Prevention (CDC), Division of Adolescent and School Health (unpublished data); CDC, Office on Smoking and Health (unpublished data).
*During the respondent's lifetime.
†Cigarette use on ≥ 1 day during the 30 days preceding the survey.
‡Cigarette use on ≥ 20 days during the 30 days preceding the survey.
§During the 30 days preceding the survey; includes chewing tobacco or snuff; males only.
△When riding in a car driven by someone else.
¶During the 12 months preceding the survey.
**During the 30 days preceding the survey; includes any weapon such as a gun, knife, or club.

Cigarette use is most likely to precede use of other substances and to be prevalent among users of other drugs.

Cigarette Smoking and Other Health-Related Behaviors

Available data on the relationships between cigarette smoking and other health-related behaviors are derived from cross-sectional studies and thus suggest that other behaviors may covary with adolescent smoking. Even if the direction of influence is not established, information on the extent of these relationships is useful for intervention, since such data may suggest a syndrome of health-compromising behaviors that need to be considered together.

Data from the 1991 YRBS indicate that high school students who reported practicing other selected health-risk behaviors were more likely to be past-month or frequent smokers than were those who reported fewer selected health-risk behaviors. For example, students in the survey were more likely to be past-month or frequent smokers if they rarely or never wore seat belts, had participated in a physical fight six or more times during the preceding year, had carried weapons one or more days during the preceding month, or had made one or more suicide attempts during the preceding year (Table 27). Students were also more likely to be past-month or frequent smokers if they had ever had sexual intercourse, had had sexual intercourse with four or more partners during their lifetime, or had not used a condom during their most recent sexual intercourse (Table 28). These relationships for sexual risk behaviors held for males and females, regardless of age (CDC, OSH, unpublished data). Lastly, students were more likely to be past-month or frequent smokers if they had not participated on any sponsored sports teams during the preceding year or if they had used steroids without a doctor's prescription (Table 29).

Cigarette Smoking and Health Status

Pregnancy and Smoking

Data on maternal smoking status during pregnancy are recorded on birth certificates in 43 states and the District of Columbia (NCHS 1992b). In these states, the overall maternal smoking prevalence was 20 percent in 1989. Maternal smoking among adolescent women

Table 28. Percentage of high school students who used tobacco, by sexual risk behaviors, Youth Risk Behavior Survey, United States, 1991

Risk behavior	Number	Any cigarette use*	Current cigarette use†	Current frequent cigarette use‡	Current smokeless tobacco use§
Sexual intercourse△					
No	5,011	55.1	13.8	3.1	12.9
Yes	6,508	82.6	38.8	20.7	23.9
Number of sexual partners△					
1–3	4,048	81.0	33.8	15.4	23.2
≥ 4	2,443	85.4	47.9	30.3	24.9
Condom use¶					
No	2,494	86.4	46.2	27.5	23.8
Yes	2,091	79.3	36.0	18.5	26.6

Sources: Centers for Disease Control and Prevention (CDC), Division of Adolescent and School Health (unpublished data); CDC, Office on Smoking and Health (unpublished data).

* During the respondent's lifetime.

† Cigarette use on ≥ 1 day during the 30 days preceding the survey.

‡ Cigarette use on ≥ 20 days during the 30 days preceding the survey.

§ Any smokeless tobacco use, including chewing tobacco or snuff, during the 30 days preceding the survey; males only.

△ During the respondent's lifetime.

¶ During last sexual intercourse, among students who had sexual intercourse during the 3 months preceding the survey.