Changing Patterns of Drug Use Among US Military Recruits Before and After Enlistment

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ABSTRACT

Objectives. The US armed forces adopted "zero tolerance" policies concerning illicit drug use in 1980 and later developed policies to discourage tobacco and alcohol abuse. This article examines drug use among young active-duty recruits both before and after enlistment, compared with nonmilitary age-mates, and documents historical shifts in such drug use across 2 decades.

Methods. Analyses employed longitudinal panel data from 20 nationally representative samples of high school seniors (cohorts of 1976–1995), each surveyed just before graduation and again within 2 years. Separate analyses for men (n = 12 082) and women (n = 15 345) contrasted those who entered military service, college, and civilian employment.

Results. Illicit drug use declined more among young military recruits than among their civilian counterparts. Analyses of male recruits at multiple time periods showed (1) declines in the prevalence of marijuana use and cocaine use after the initiation of routine military drug testing and (2) lower proportions of smokers of half a pack or more of cigarettes per day who entered service after the initiation of tobacco bans during basic training.

Conclusions. Recent military drug policies appear to deter illicit drug use among enlistees and discourage some smokers from enlisting. (*Am J Public Health.* 1999;89:672–677)

Stereotypes of psychoactive substance use in military service abound, and they extend back through centuries. Rations of rum were deemed essential for soldiers' morale in the American Revolutionary Army, and the picture of the hard-drinking US serviceman has persisted,[1] at least until very recently. Similarly, GIs in World Wars I and II were issued cigarettes with their rations and were routinely pictured smoking cigarettes. The use of illicit drugs among military personnel in Vietnam was widespread and widely publicized.[2–4]

In recent years, however, a dramatically different picture has emerged concerning drug use in the US armed forces; a policy of "zero tolerance" with respect to illicit drug use is firmly in place, and new policies promoting healthy lifestyles have focused attention on reducing tobacco use and alcohol abuse.[5–10] Because military service involves a high level of commitment to, and involvement in, an institution that strictly organizes many aspects of an individual's lifestyle, these new policies might reasonably be expected to have important impacts on the behaviors of military personnel.

Surveys conducted by the US Department of Defense have documented decreases in illicit drug use[11,12] and in cigarette smoking[13] among service personnel from 1980 through 1995. In this article, we attempt to place these changes within the context of important broad secular trends in civilian substance use during that period[14,15] and also explore to what extent changes in the military reflect "selection" (i.e., different kinds of individuals entering the armed forces) vs "socialization" (changes in substance use after entry). This research, using nationwide survey data from the Monitoring the Future project, tracks respondents longitudinally starting at the end of high school, thereby permitting examination of drug use patterns both before and after enlistment. Our analyses also include large nonmilitary comparison groups, thus providing data on broad secular trends.

Earlier analyses of Monitoring the Future panel data covering 2 decades (1976–1995) have shown overall differences in drug use between those in military service and those in civilian jobs, both before and after extensive controls for marital and parental status, educational status, and living arrangements; however, those analyses did not explore whether drug use patterns linked to military service shifted throughout this period.[16] A central feature of the present research is its focus on changes in military-related drug use patterns during the past 2 decades. These analyses do not examine service-specific substance use policies and their impacts, and thus they cannot substitute for detailed Department of Defense surveys; rather, they provide broad comparisons that may have policy implications for the population as a whole.

Methods

Samples and Survey Methods

This article employs panel data from the Monitoring the Future project, an ongoing

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nationwide study of youth conducted by the Institute for Social Research under a series of grants from the National Institute on Drug Abuse.[14,17,18] The project's cohort-sequential design includes (1) self-completed questionnaires group-administered to nationally representative samples of approximately 17 000 high school seniors in the spring of each year, beginning with the class of 1975 and continuing with each class thereafter (average response rate = 83%) and (2) follow-up surveys mailed to subsamples (2400 individuals) from each senior class. The first follow-up surveys of each class are sent either 1 year (for a random half of each sample) or 2 years after graduation (average response rate = 80%). Panel analyses that included later follow-up surveys, which occur at 2-year intervals, have been reported in other publications[18,19]; data from the later follow-ups were not used in the present analyses.

Our purpose was to examine patterns of change in drug use when young adults enter military service and how those patterns may have shifted throughout the 2 decades since 1976. The panel data reported here can be characterized as largely representative of young individuals who enlist soon after high school graduation. However, the data are limited by the fact that within each follow-up cohort, enlistees constitute relatively small numbers of men and very small numbers of women, and the small numbers limit the reliability of point estimates. In addition, panel attrition is slightly greater among drug users, so very modest reweightings were incorporated in the analyses to avoid underestimating drug use, particularly cigarette use.[14] Also, other analyses of Monitoring the Future data reveal that those in military service are somewhat more likely than average to underreport past illicit drug use and perhaps also more recent use. Regarding the last point, however, the evidence suggests that such effects are modest,[20] and comparisons of the present findings with worldwide military surveys, conducted anonymously by civilian agencies,[11] show no statistically significant differences.

As discussed elsewhere,[16,19] most new high school graduates choose either college or civilian employment as their next primary activity, with small proportions of men and very small proportions of women choosing military service. Accordingly, in this paper focusing on young graduates in military service, we chose as comparison groups those in full-time education and those in full-time employment. Prior analyses of Monitoring the Future panel data[18,21] have found substantial differential changes in drug use rates linked to living arrangements, particularly to leaving the parents' home. Virtually all of those in the military subsamples had left the parental home, but for the comparison groups it was useful to make further distinctions according to whether or not they were still living with their parents at the time of follow-up.

These analysis decisions yielded subgroups and total (weighted) numbers of young (modal age = 19–20 years) high school graduates, as shown in Table 1. The left side of the table combines 20 graduating classes (1976–1995) and presents data separately for men and women. The right portion of the table shows data for men separated into 5 groupings of 4 graduating classes each (1976–1979, 1980–1983, 1984–1987, 1988–1991, and 1992–1995). The numbers of women enlistees were too small to justify a similar breakdown in this article, but the data are available from the authors.

Drug Use Measures

Among the large set of self-report drug use measures included in the Monitoring the Future surveys, the following 4 prevalence measures were selected for examination: (1) daily use of half a pack or more of cigarettes (during the past 30 days), (2) consumption of 5 or more alcoholic drinks in a row on at least 1 occasion during the past 2 weeks, (3) any use of marijuana during the past 30 days, and (4) any use of cocaine during the past 30 days. Although data are also available for use during the past 12 months for the 2 illicit drugs, we felt that the current (past month) data would be more sensitive to changes. All of these measures are identical in senior year and follow-up surveys and are described in detail in other publications.[14,22] Other panel analyses of Monitoring the Future data have found that patterns of cross-time correlations for substance use measures, and estimates of reliability, are largely consistent over the past 2 decades.[18]

Statistical Analyses

For each of the 4 drug use dimensions, we computed 3 scores for each individual: (1) "Before" (i.e., end of the senior year of high school) drug use, coded "1" (indicating use at the specified level) or "0"; (2) "After" (i.e., 1 or 2 years after high school) drug use, similarly coded "1" or "0"; and (3) "Change," calculated as the After score minus the Before score (with –1, 0, and +1 as possible scores). Analyses were carried out separately for men and women. Significance tests contrasted the military enlistee subgroup with each of the other subgroups, on all 3 scores (Before, After, and Change), for each of the 4 substance use measures, and in each of the five 4-year time periods. The Dunnett test was used to calculate the significance test scores, with a significance level of 0.05 (2-tailed). The Dunnett test was appropriate because it is designed to hold the maximum experimentwise error rate involved in multiple comparisons to a level less than or equal to 0.05.[23] Further, a sign statistic was calculated for each change score to test the null hypothesis that the sample median was zero (indicating no change). Unless otherwise stated, all differences and contrasts discussed in the text are significant; a detailed reporting of significance tests and percentage values corresponding to Figures 1 through 3 is available from the authors.

Results

Drug Use of Men and Women Across Total Time Period

Figure 1 presents prevalence rates for all 4 types of drug use, shown separately for men and women across all 20 graduating classes combined (1976–1995). Those who entered military service were about 2.5 times as likely to be half-pack-per-day cigarette smokers as those who entered college; this was true at the end of high school and remained true 1 to 2 years later. Smoking rates for those who entered the military were fairly similar to rates for those who entered full-time civilian employment. The figure also shows, for all subgroups, substantial increases in the proportions of those who smoked more than a half pack per day. This reflects the fact that many who were regular smokers during high school increased their consumption soon after graduation, often crossing the half-pack threshold.[18]

The prevalence of occasional heavy drinking, defined as consuming 5 or more drinks in a row at least once during the preceding 2 weeks, increased 6% (nonsignificant) among young men who entered military service and more markedly among those who left home to enter college. The drinking data for the small number of women who entered military service do not replicate those for men; they showed a small (nonsignificant) decrease, which contrasts with the sharp increase among women who left home to go to college.

Figure 1 also shows that, for both men and women throughout most of the past 2 decades, the prevalence of marijuana use dropped sharply after military enlistment and the prevalence of cocaine use decreased somewhat. Among men, the change in the prevalence of marijuana use among enlistees was significantly different from (more negative than) the changes for any of the comparison groups; similarly, marijuana change scores among the small number of female enlistees showed more decrease than among any of the comparison subgroups (all comparisons

TABLE 1—Numbers of Cases, by Post-High School Occupation Subgroups, Sex, and Class Year Groupings[a]

	Males 1976–1995	Females 1976–1995	Males 1976–1979	Males 1980–1983	Males 1984–1987	Males 1988–1991	Males 1992–1995
Military[b]	792	167	141	178	196	172	105
Full-time job/living with parents	2292	2212	538	476	488	404	386
College/living with parents	2244	3015	425	478	434	483	425
Full-time job/not living with parents	909	1477	225	167	181	167	169
College/not living with parents	3646	4823	655	682	686	847	776
Other	2199	3651	357	488	413	499	441
Total	12082	15345	2341	2469	2398	2572	2301

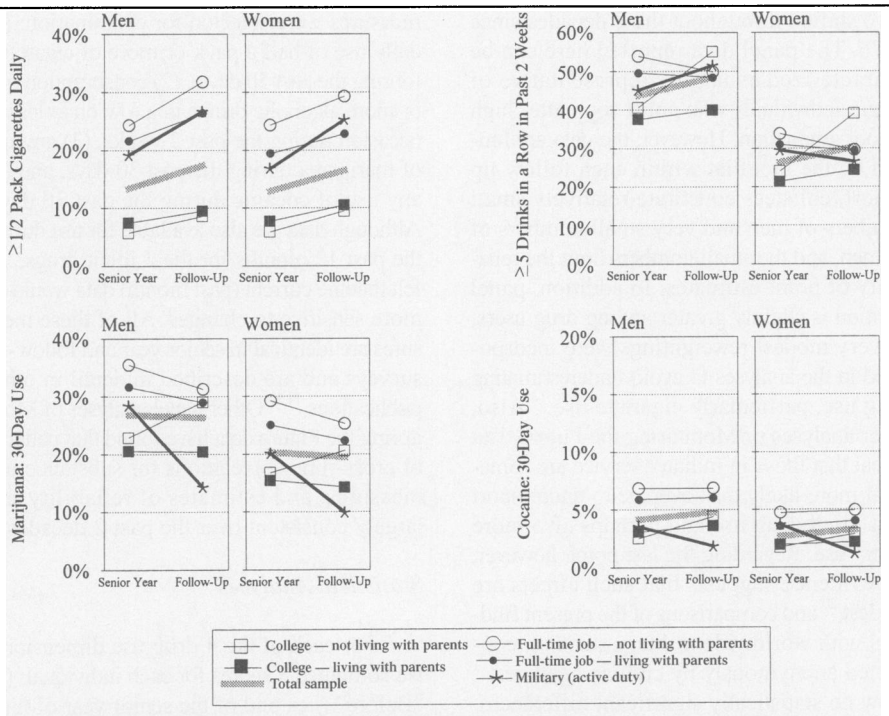
Note. The table presents numbers of cases used in ANOVA analyses. Panel data were collected from annual random samples of high school seniors in the 48 contiguous states; senior-year responses were compared with responses obtained 1 to 2 years after high school.

[a]The actual numbers of cases are slightly higher than those shown here, because all cases are weighted to adjust for differential selection probabilities and for differential panel attrition rates by drug use. The follow-up samples are drawn so as to be self-weighting, with 1 important exception: because the primary focus of the study is on drug use, users of illicit drugs (as seniors) are oversampled (by a factor of 3 to 1), and sampling weights are used in all analyses to adjust for the differential selection probabilities. The cases presented here are for the heavy-drinking item. All other drug questions have slightly higher response rates.

[b]Respondents were assigned to post-high school occupation categories sequentially. First, those who were serving in the active-duty armed forces were identified and coded "military" and the remaining respondents were temporarily coded as "other." Next, from the pool temporarily coded as "other," those who had a full-time job and were living with their parents were identified and coded as "full-time job/living with parents" and the remaining respondents were again temporarily coded as "other." This process was repeated until all subgroups used in these analyses were isolated. Those who did not fit any of the occupational subgroups were finally coded as "other."

except 1 were statistically significant). The cocaine use patterns, although broadly consistent with those for marijuana, involved relatively low prevalences, and many comparisons did not reach statistical significance.

Figure 1 shows gender similarities in some respects and gender differences in other respects. The overall patterns of change between base year and follow-up are fairly parallel between men and women across all subgroups, suggesting that the factors contributing to change are similar across genders. However, overall prevalence rates differ importantly, with somewhat more men than women reporting marijuana use and cocaine use and substantially more men reporting instances of heavy drinking (consistent with gender differences, on average, in the physical effects of 5 or more drinks in a row). This illustrates why analyses that combined men and women would be inappropriate: the military subgroup would show misleadingly high levels of heavy drinking, for example, because it consists of about 87% men, in contrast to the other groups, which all consist of more equal proportions of women and men.

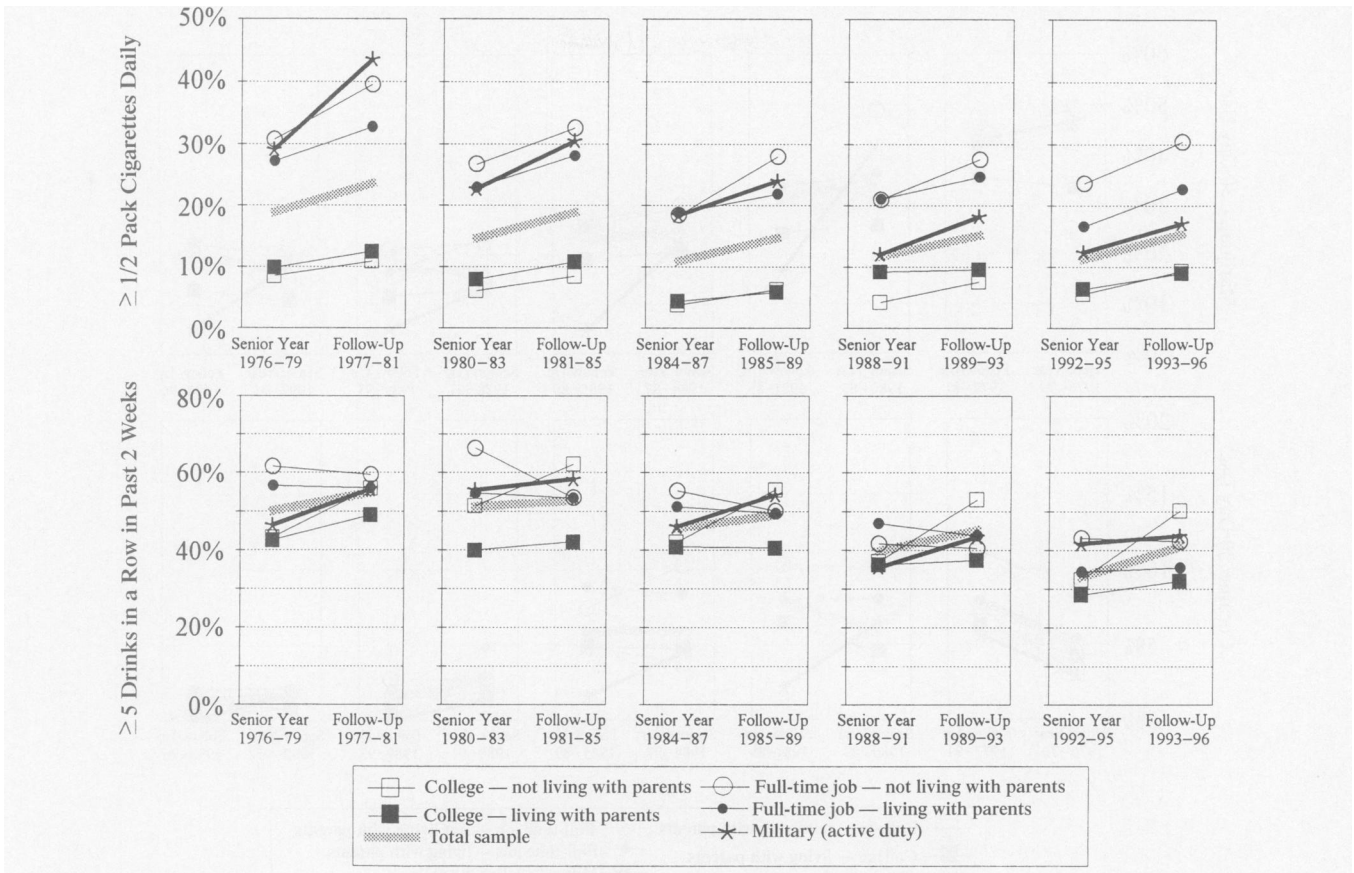


Note. The figure represents results of ANOVAs of panel data collected from annual random samples of high school seniors in the 48 contiguous states; senior-year responses were compared with responses obtained 1 to 2 years after high school.

FIGURE 1—Prevalence of substance use by gender (1976–1995, combined).

Drug Use Among Men in Military Service: Changes Across 2 Decades

The upper portion of Figure 2 shows that daily consumption of a half pack or more of cigarettes declined among the total samples of young men (shaded lines) from the mid-1970s through the mid-1980s (equally true for base year and follow-up) and then showed relatively little change thereafter. Among young male enlistees, however, the change across time was more dramatic. Specifically, during the first 3 time intervals (covering the high school classes of 1976–1987, with follow-up surveys in 1977–1989), half-pack-per-day smoking rates among young male enlistees were roughly half again as large as the average rates for all young men; however, during the last 2 intervals (classes of 1988–1995, with follow-ups in 1989–1997), smoking rates among male enlistees were just about equal to the overall averages for men. Significantly, Figure 2 also suggests that this abrupt shift reflected selection factors—that is, a decline in the proportions of smokers who became recruits—rather than any sort of socialization factors causing a decline in smoking after entry.



Note. The figure represents results of ANOVAs of panel data collected from annual random samples of high school seniors in the 48 contiguous states; senior-year responses were compared with responses obtained 1 to 2 years after high school.

FIGURE 2—Changes in prevalence of smoking and heavy drinking among men in different time periods.

Indeed, half-pack-per-day smoking rates increased at least as much among men who entered military service as among those who entered other walks of life, but from the late 1980s onward, the military no longer attracted disproportionate numbers of young men who had been half-pack-per-day smokers before they left high school.

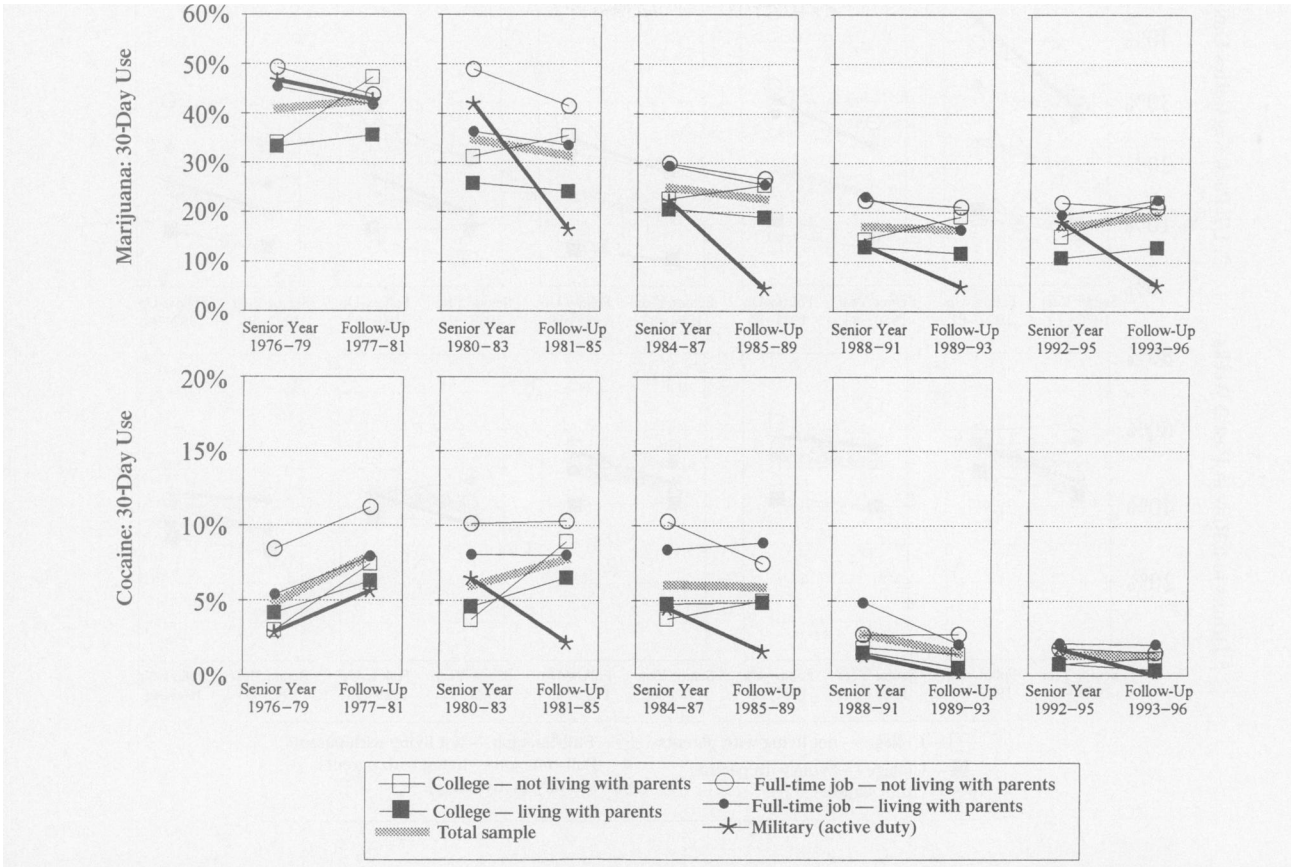
The lower portion of Figure 2 shows that instances of heavy drinking declined among young men in general during the past 2 decades, and that the same was true for military recruits. For the first 3 time intervals, the data for military recruits were fairly similar to the data for young men who left home to go to college; however, in the last 2 intervals the recruits did not show increases of the sort shown by the students who had left home (change scores are significantly different for the last interval only).

Figure 3 shows that illicit drug use among young enlistees shifted substantially over the past 2 decades. The findings are mostly parallel for the 2 illicit drugs shown, although the patterns are more pronounced for the widely used drug marijuana than for cocaine. Marijuana use among the total samples of young men (shaded lines in Figure 3, upper portion) declined substantially during the 1980s, but the shifts in marijuana use among young enlistees were far more pronounced than the general downward secular trend. During the senior year of high school, young men who would soon enter military service were about as likely as their classmates to have used marijuana during the month preceding the survey; however, from 1981 onward, marijuana use dropped dramatically after enlistment, in contrast to the post–high school use rates for all of the comparison groups (of 16 change score comparisons matching military enlistees with 4 comparison groups at each of 4 time periods, 13 showed significant differences). The patterns for cocaine prevalence were similar, as noted above; however, the overall use levels for all groups were low, and most differences fell short of statistical significance.

Discussion

The analyses of young men and women reported here employed panel data from the Monitoring the Future project and focused on changes in substance use among those who enter military service during the first year or two after high school (Figure 1). These analyses provided results consistent with earlier analyses of Monitoring the Future data that covered up to 14 years after high school.[18] The additional analyses focusing on young men at multiple time periods (Figures 2 and 3) yielded important new insights by documenting how substance use among military recruits has changed during the past 2 decades. Of course, correspondence among historic events is not sufficient to demonstrate causation; nevertheless, the shifts in substance use rates among new young recruits coincide closely with new military policies and are at least strongly suggestive of causal relationships.

Illicit drug use, especially marijuana use, showed striking declines among young men who enlisted in military service during the



Note. The figure represents results of ANOVAs of panel data collected from annual random samples of high school seniors in the 48 contiguous states; senior-year responses were compared with responses obtained 1 to 2 years after high school.

FIGURE 3—Changes in prevalence of illegal drug use among men in different time periods.

1980s, a time when such use also declined for the population as a whole. The present study, however, shows that beginning in 1981 the declines among those in military service were more pronounced than the declines among their civilian counterparts. In 1980, all branches of the armed forces began mandatory routine urinalysis testing for opiates, barbiturates, amphetamines, and cocaine. In late 1981, the navy initiated a program of urinalysis testing for illicit drugs, including marijuana, using portable testing units; the program was expanded to include annual random testing of all service personnel and testing of all recruits during the accession process.[5]

There has been much debate about the relative merits of "supply reduction" and "demand reduction" as alternative (but not incompatible) strategies for reducing illicit drug use.[24] Demand reduction generally refers to a reduction in the extent to which individuals "choose" to use drugs, including options ranging from education to fairly strong coercion. Potential military recruits are explicitly warned that they will be tested periodically for illicit drug use and that discovery of use is grounds for dismissal. Furthermore, in an institution like the military, monitoring can be extensive and violation can effect a broad range of life consequences. Our data show that under these circumstances, which we might describe as "coerced demand reduction," very high proportions of servicemen and servicewomen have "chosen" not to use illicit drugs, consistent with other analyses focused on navy personnel.[6]

The prevalence of half-pack-per-day smoking among male recruits shifted sharply in the late 1980s. In the late 1970s, young men entering military service were similar to those entering civilian employment in terms of their cigarette use and were about 3 times as likely as college-bound young men to be smokers of a half pack or more per day. Although smoking rates for all subgroups dropped during the next decade, reflecting important overall cohort-related changes,[14] the relationships among these subgroups remained much the same until the late 1980s. However, beginning in the mid-1980s, the armed forces adopted a series of reforms designed to reduce tobacco use among military personnel. Smoking cessation courses were offered to all service persons, smoke-free building policies were established, and cigarette prices at post commissaries were increased. Most important, beginning in 1989, all new recruits were required to be tobacco-free during the basic training period.[9,10,25,26] Clearly, these actions—taken by the Office of the Assistant Secretary of Defense for Health Affairs, other Department of Defense agencies, and base commands—have changed the institutional culture of the military regarding tobacco, and by the late 1980s that change was communicated quite clearly to most prospective recruits, particularly those who were already regular smokers.

It is instructive to contrast 2 kinds of change—those involving illicit drugs, especially marijuana, and those involving smoking. For both types of substances, major departures from general historical patterns (secular trends) occurred. Also, the changes in drug use corresponded closely with dramatic shifts in military policies, although

they occurred at somewhat different times. The nature of the changes differed between substances, however, in ways that illustrate the different average levels of dependency.

Throughout the period under study, most high school seniors who reported any marijuana use during the past 30 days used it roughly once per week, and fewer than 1 in 4 users reported using it 20 or more times (i.e., used it on a daily basis or nearly so).[14] As shown in Figure 3, beginning early in the 1980s, nearly all those who used marijuana near the end of their senior year of high school were apparently able to stop such use if they entered the armed forces.

In contrast, those who were half-pack-per-day smokers by the end of high school were deeply involved (generally 10 times or more per day) in a highly habit-forming behavior. It appears that many regular smokers were deterred from entering the armed forces when confronted with the prospect of a tobacco-free basic training experience (and perhaps some others entered briefly, only to discover firsthand that they could not meet the tobacco-free basic training requirement). So, whereas the changes in marijuana use associated with military service fit a socialization pattern in which individuals change their behaviors in response to new social situations, the changes involving smoking appear to reflect primarily selection (i.e., fewer smokers select entrance into military service). Moreover, Figure 2 suggests that the smoking habit is deeply enough ingrained that most smokers who make it through basic training quickly return to the habit; these findings are consistent with a recent study of over 3000 air force recruits that found that 74% of tobacco users returned to use within 90 days after being forced to abstain during basic training.[27]

In sum, it appears that efforts by the armed forces to prevent illicit drug use are having considerable success. The story for legally available substances is more complicated. Reducing instances of heavy drinking remains a difficult challenge facing the armed forces, given the extent to which being able to "hold one's liquor" is part of the stereotype of the typical soldier. Efforts to reduce tobacco use in the military may have made enlistment less attractive to those who are already regular (i.e., half-pack-per-day or more) smokers before the end of high school; however, the challenge remains to reduce or eliminate tobacco use among those smokers who do enlist. □

Contributors

J. G. Bachman, P. M. O'Malley, and L. D. Johnston designed the study. P. Freedman-Doan analyzed the data. J. G. Bachman, P. Freedman-Doan, and D. R. Segal each contributed to the writing of the first draft of the paper. All authors participated in further review of the paper and preparation of the draft submitted.

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The University of Michigan Institutional Review Board approved this study and the consent information provided to the respondents.

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