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Smoking, Drinking, and Drug Use among American High School Students: Correlates and Trends, 1975-1979

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Abstract: This paper uses findings from five nationally representative surveys of high school seniors from 1975 through 1979 to examine the correlates of licit and illicit drug use, and to consider whether recent changes in youthful drug use are linked to any changes in the correlates. Males still exceed females in use of alcohol and marijuana, but no longer in cigarette smoking. Black seniors now report less drug use than Whites. Other dimensions of family background, region, and urbanicity show only modest associations with drug use. Above average drug use occurs among those less successful in adapting to the educational environment, as indicated by truancy and low grades; those who spend many evenings out for recreation;

and those with heavy time commitments to a job and/or relatively high incomes. Drug use is below average among seniors with strong religious commitments and conservative political views. From 1975 through 1979, among seniors cigarette use peaked and subsequently declined, marijuana use rose and then leveled off, and the (still infrequent) use of cocaine rose rapidly. However, these shifts in drug use were not accompanied by substantial shifts in the above correlates of use. The findings thus suggest that the kinds of young people most at risk remain much the same, while the types and amounts of substances they use shift somewhat from year to year. (*Am J Public Health* 1981; 71:59-69.)

Introduction

A growing body of research has focused on the rise in drug use by adolescents¹⁻¹⁰ and the possible causes and consequences of such use.¹¹⁻³⁵ One contributor to that research has been the Monitoring the Future project, an ongoing nationwide study of high school seniors conducted by the University of Michigan Institute for Social Research under a grant from the National Institute on Drug Abuse. A primary purpose of the project is to monitor levels of drug use among youth, and to provide early indications of changes and trends.⁵⁻⁷ Another purpose is to add to an understanding of the correlates of drug use, particularly those correlates which may prove to be among the important causes and/or consequences of use.

The present report deals with three interrelated aspects of substance use—both licit and illicit:

- the use of cigarettes, alcohol, marijuana, and other illicit drugs by seniors in the high school classes of 1975 through 1979, with special attention to changes in the levels of use during that period;
- important background, experience, and lifestyle factors as correlates of drug use; and

- the extent to which overall shifts in levels of drug use during the late 1970s have coincided with overall shifts in the levels (i.e., mean values) of some important correlates of drug use, or in the patterns of correlation with drug use.

During the period from 1975 through 1979, the drug usage of high school seniors has changed in a number of significant ways. Thus it is of interest to consider whether there are corresponding changes in the correlates of drug use, since such changes may yield important insights into underlying patterns of causation.

Materials and Methods

The Monitoring the Future project has been surveying large nationally representative samples of high school seniors in approximately 115 public and 15 private high schools during the spring of each year since 1975.* The design and procedures for the project have been spelled out extensively elsewhere.^{5-7, 36, 37} The sampling procedure is multi-stage,³⁸ with stage 1 the selection of particular geographic areas, stage 2 the selection of one or more high schools in each area, and stage 3 the selection of seniors within each high school. This procedure results in an area probability sample of the 48 coterminous states. For purposes of the present analyses, the number of cases employed from the 1975

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*The project also follows up a portion of each graduating class with mailed questionnaires; thus it can be described as employing a cohort-sequential research design. The follow-up aspect of the study is not utilized in the present paper, but it will be exploited extensively in future reports.

sample is approximately 9,400; for subsequent years the numbers range from 15,400 to 17,800.**

Data are collected by questionnaires administered in classrooms during a normal class period, although circumstances in some schools require larger group administrations. The administrations are conducted by locally-based Institute for Social Research representatives and their assistants, following carefully standardized procedures.

Rates of Participation and Validity

Depending on the year, from 66 per cent to 80 per cent of the schools invited to participate agreed to do so. Whenever a school refuses, a similar school (in terms of size, geographic area, and urbanicity) is recruited as a replacement. The reasons for a school refusing to participate are varied; only a small proportion specifically object to the drug content of the survey. It thus seems reasonable to conclude that school refusals have not seriously biased the surveys.

Completed questionnaires are obtained from 77 to 83 per cent of all sampled students each year. Explicit refusals to complete the questionnaires are infrequent; it is estimated that they represent only about 1 per cent of the target sample. A much more important factor limiting the student response rate is absence from class at the time of data collection. Kandel found that students with high absentee rates had higher than average rates of drug use;⁴⁰ and in the current study, among all students who do complete questionnaires, those who report high rates of absenteeism also report above average rates of drug use. Therefore, the obtained sample slightly underestimates actual rates of drug use by all high school seniors. This particular bias is small, however, and not judged important enough to warrant the use of special corrective weighting procedures.^{6, 37}

We consider the samples to represent high school seniors rather accurately; moreover, the biases that exist are likely to be fairly consistent from one year to the next, which means that they will have little effect on the measurement of trends. But it should be kept in mind that although the present design is effective in sampling high school seniors, it does not include in the target population those young men and women who drop out of high school before graduation—between 15 and 20 per cent of each age cohort.⁴¹ Given that dropouts are above average in use of drugs,^{11, 18} this means that drug use rates for the total age cohort (approximately age 18) are somewhat higher than the rate for samples of seniors.

**The multi-stage sampling design used each year produces larger sampling errors than would a simple random sample of equivalent size, thus making it inappropriate to rely upon the usual formulae for testing statistical significance.³⁸ For statistics in the present paper the estimated design effect is 3.7, so the frequencies used to calculate statistical significance are equal to the actual numbers of cases divided by 3.7 (or 3.1 in the case of 1975 data).^{37, 39}

The number of cases is smaller in 1975 for three reasons: the 1975 sample was somewhat smaller than in subsequent years, only four out of the five questionnaire forms are used in this analysis, and missing data occurred more often in 1975. Extensive analyses of these data have left us confident that the reduced number of cases in 1975 has not seriously affected the representativeness of the sample.

A good deal of inferential evidence in support of the validity of the self-report measures of drug use employed in these surveys has been summarized elsewhere.⁶ However, there is also clear evidence that reported drug use over relatively short intervals such as one month is systematically greater than would be inferred from self-reports for longer time intervals such as one year. We interpret this discrepancy to be the result primarily of recall errors; moreover, we suspect that distinctions between any use or no use during the past year are likely to be fairly accurate, whereas estimates of total number of uses over a one-year period are likely to be underestimated by the more frequent users.⁴²

Measures

All measures discussed herein, except region and urbanicity, are based entirely on students' responses to closed-ended questionnaire items. Although five different questionnaire forms are used in the study, the present report deals only with items which are common to all forms. The measures of drug use are presented in the Appendix; other measures are described briefly, when necessary, in the text or footnotes; all are described in greater detail elsewhere.³⁹

Results

Trends in High School Seniors' Drug Use

Table 1 presents trends in use of cigarettes, alcohol, marijuana, and other illicit drugs. Figure 1 displays trends separately by sex showing monthly prevalence.

Cigarette use among high school seniors appears to have reached a peak in the classes of 1976 and 1977, and is now trending downward. Figure 1 shows that females now exceed males in proportion smoking one-half a pack or more each day, as well as in total percentage reporting any cigarette use during the past month.

Alcohol use has risen only modestly during the late 1970s. As indicated in Figure 1, the large majority of seniors (two-thirds of the females and more than three-fourths of the males) reported some use during the past month; but only small proportions reported daily or near daily use of alcohol. Perhaps the most serious drinking problem among seniors is reflected in a different questionnaire item; when asked how often they had taken five or more drinks in a row during the prior two weeks, 52 per cent of the males and 31 per cent of the females in 1979 reported doing so on at least one occasion, while 26 per cent of males and 12 per cent of females reported doing so on three or more occasions. Each of these percentages has risen by 3 or 4 per cent since 1976 (data not shown).

Marijuana use showed a dramatic rise during the 1960s and the early 1970s.^{1, 2, 9, 18} Our own data indicate that the trend continued strong from 1975 through 1978; however, the data for the class of 1979 show no increase at all over the previous year, thus suggesting that marijuana use may have peaked for this age group. It remains to be seen whether these rates will now begin to decline along with cigarette smoking rates.

In contrast to the rather volatile shifts in marijuana use, there has been only a very slight upward trend in the overall

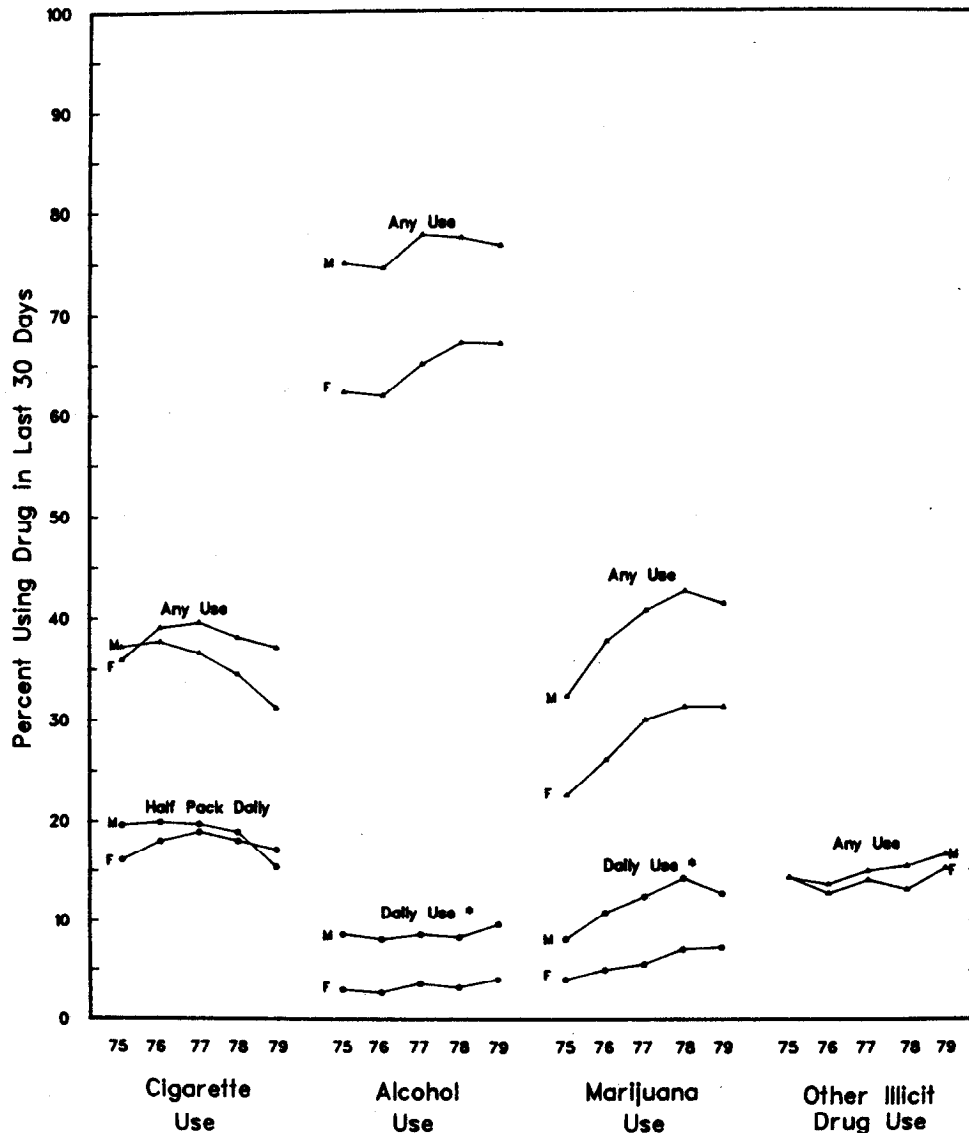


FIGURE 1—Trends in Thirty-Day Prevalence of Cigarette, Alcohol, Marijuana, and Other Illicit Drug Use by Male and Female Seniors, 1975-1979

proportion of seniors involved in other illicit drug use in the late 1970s (see Table 1). From 1975 onward, just over one-fourth of both males and females reported any use of some illicit drug other than marijuana during the prior year. While this overall proportion has remained fairly stable, some interesting changes have been occurring for specific drug categories, as we have documented elsewhere.^{6, 7} The most dramatic shift in popularity involves cocaine; annual prevalence rose from 5.6 per cent in the class of 1975 to 12 per cent in the class of 1979—a two-fold increase in four years. Nevertheless, most of these users in 1979 reported use on only a handful of occasions during the past year; only 2 per cent used cocaine as often as once a week; and daily or near daily use was reported by only 0.2 per cent.⁷

Correlates of Drug Use

Table 2 and Figure 2 present data on correlations from the class of 1979 in two different but complementary forms.

Table 2 provides product-moment correlations between each measure of drug use and each of the background and lifestyle variables to be examined in this paper.^{***} The Table also summarizes regression analyses in which all of the background and lifestyle variables are used simultaneously as "predictors" of each measure of drug use.[‡] Figure 2 displays graphically the percentage of seniors who have used each category of drug during the last month, shown as a function of each "predictor" variable.^{‡‡}

^{***}Product-moment correlations measure the degree of linear association between two variables. We consider this statistic appropriate for the relationships treated here, since all have been examined and found to show little or no curvilinearity.

[‡]The term "predictor" is used as a matter of convenience, but is enclosed in quotation marks as a reminder that a single direction of causation is not assumed.

^{‡‡}A dichotomous measure of any or no use during the last 30 days provides a clearer and more easily interpreted picture than, for

TABLE 1—Trends in Self-Reported Drug Use among High School Seniors, 1975–1979

	Scale Range ^a	Means for Senior Classes of:					Trend ^b
		1975	1976	1977	1978	1979	
Cigarette Use							
History during Lifetime	1–5	2.728	2.813	2.811	2.782	2.697	–.078 ^{c***}
Any Use during Last 30 Days	0–1	0.367	0.388	0.384	0.367	0.344	–.091 ^{c***}
Half-Pack-a-Day, Last 30 Days	0–1	0.179	0.192	0.194	0.188	0.165	–.071 ^{c***}
Alcohol Use							
Occasions during Last 12 Months	1–7	4.160	4.196	4.308	4.372	4.418	+ .124 ^{***}
Any Use during Last 30 Days	0–1	0.682	0.683	0.712	0.721	0.718	+ .079 ^{***}
20+ Uses during Last 30 Days	0–1	0.057	0.056	0.061	0.057	0.069	+ .049 [*]
Marijuana Use							
Occasions during Last 12 Months	1–7	2.467	2.691	2.811	2.966	2.954	+ .214 ^{***}
Any Use during Last 30 Days	0–1	0.271	0.322	0.354	0.371	0.365	+ .203 ^{***}
20+ Uses during Last 30 Days	0–1	0.060	0.082	0.091	0.107	0.103	+ .159 ^{***}
Other Illicit Drug Use							
Any Use during Last 12 Months	0–1	0.248	0.245	0.251	0.261	0.273	+ .057 [*]
Any Use during Last 30 Days	0–1	0.143	0.132	0.145	0.144	0.161	+ .050 [*]
Approximate N =		9400 ^d	15400	17100	17800	15500	

^{*}Significant at .05 level (2-tailed); based on t-test using Ns adjusted for design effect.

^{**}Significant at .01 level (2-tailed).

^{***}Significant at .001 level (2-tailed).

^aSee Appendix for description of scale values.

^bThe "Trend" score is the shift from 1975 to 1979 expressed as a function of a standard deviation: $\bar{X}_{79} - \bar{X}_{75}/SD$, where SD is the mean of SD₇₅ and SD₇₉.

^c"Trend" scores for cigarette use are the shift from 1976 to 1979.

^dBased on four of the five questionnaire forms.

Sex differences in drug use were reviewed in the preceding section, and are displayed in the form of correlation coefficients and standardized regression coefficients in Table 2. The correlations tell essentially the same story as Figure 1: females now exceed males in use of cigarettes, males average more use of alcohol and marijuana than do females, and there is no appreciable difference in the overall proportion of each sex who have used at least one illicit drug beyond marijuana. For some of the specific illicit drug categories, however, there are some important sex differences in amount of use, with males exceeding females by a considerable amount.^{6, 7}

An additional perspective on sex differences in drug use is provided by the standardized regression coefficients included in Table 2. For example, the relationship between sex and cigarette use is represented by a zero-order (i.e., unadjusted) correlation of .07, whereas the regression coefficient is .14. The latter value indicates the "contribution" of sex when other dimensions such as grades, truancy, and religious commitment are included in the predictive equation. The shift from .07 to .14 occurs because, based on their average scores on these other dimensions, females would be expected to smoke less than males. Females can thus be described as "overachievers" in terms of cigarette smoking—they do more than would be predicted based on their other characteristics.

example, mean amount of use during the past year. Frequency of use during the past year, on the other hand, produces stronger correlation coefficients than any dichotomy, and thus is the more appropriate type of measure for use in Table 2.

The regression coefficients for alcohol use and marijuana use show a different pattern of relationship with sex; controlling for other factors reduces the degree to which males exceed females in use of these drugs. In other words, one might infer that part of the reason for greater male use of these drugs is their lower average level of performance in school and lower commitment to religious values.

Racial comparisons for all four categories of drugs, but especially for alcohol, show Blacks reporting less than Whites. As Figure 2 indicates, some of these differences are more substantial than the correlation coefficients might imply; for example, over one-half the Black seniors in 1979 reported no use of alcohol during the past 30 days, in contrast to about one-fourth of the Whites. Moreover, controlling for other correlates in the multiple regression analysis does not remove the relationship with race, although it is reduced to some degree (see Table 2).

The lower reports of drug use by Blacks than by Whites appear in a number of other studies.^{2, 4, 24, 30, 32, 43} Nevertheless, at least two cautions should be borne in mind when interpreting the present data on high school seniors. First, the high school dropout rate is somewhat higher for Blacks than for Whites, thus making a survey of seniors less representative of the total age cohort for Blacks than for Whites.⁴¹ Second, it may be that some black seniors have less trust in the protection guarantees of an "establishment" research project which asks them to report their use of drugs.†††

†††This is evidenced by above average amounts of missing data and inconsistent responses to drug items by Black respondents, and by higher proportions indicating that if they had used marijuana or heroin they would not have been willing to report it in the survey.

TABLE 2—Background and Lifestyle Variables Related to Drug Use among Seniors in 1979: Product-Moment Correlations (r), Standardized Regression Coefficients (beta), and Multiple Correlation Coefficients (R and R²)^a

	Cigarette Use in Lifetime		Alcohol Use in Last 12 Months		Marijuana Use in Last 12 Months		Other Illicit Drug Use in Last 12 Months (Dichotomy)	
	r	beta	r	beta	r	beta	r	beta
Background Variables								
Sex (M = 1, F = 2)	.073	.144	-.168	-.084	-.125	-.038	-.034	.032
Race (W = 0, B = 1)	-.075	-.070	-.237	-.170	-.091	-.030	-.115	-.079
Parents' Education	-.068	.013	.104	.065	.044	.048	.031	.035
Number of Parents in Home	-.072	-.044	.017	-.008	-.064	-.041	-.063	-.052
Urbanicity	-.017	-.016	.098	.022	.116	.040	.065	.012
Region:								
Northeast	.051	.004	.128	.022	.113	.030	.044	.003
South	-.001	.009	-.105	-.031	-.122	-.041	-.075	.002
West	-.094	-.102	-.073	-.115	.004	-.040	.051	.018
North Central ^b	.029	b	.045	b	.014	b	-.007	b
Educational Experiences and Behaviors								
Curriculum (College Prep)	-.170	-.035	.004	.038	-.078	-.003	-.080	-.008
College Plans	-.219	-.080	-.034	.029	-.095	-.011	-.097	-.023
High School Grades	-.239	-.153	-.137	-.080	-.203	-.090	-.150	-.065
Truancy	.245	.138	.332	.186	.400	.252	.336	.226
Occupational Experiences and Behaviors								
Hours Worked per Week	.131	.049	.182	.044	.156	.049	.113	.037
Total Income per Week	.133	.043	.201	.060	.170	.031	.116	.012
Lifestyle Orientations								
Religious Commitment	-.172	-.090	-.262	-.151	-.294	-.163	-.212	-.106
Political Views	.127	.074	.161	.074	.205	.108	.176	.108
Evenings Out for Recreation	.244	.130	.353	.206	.340	.207	.258	.153
Frequency of Dating	.196	.070	.218	.087	.165	.028	.136	.022
Multiple Correlation-Coefficients (adjusted for degrees of freedom)								
	R _{adj} = .448		R _{adj} = .556		R _{adj} = .548		R _{adj} = .435	
	R ² _{adj} = .201		R ² _{adj} = .309		R ² _{adj} = .300		R ² _{adj} = .189	

^aThe number of cases is approximately 15,500. Assuming a sampling design effect of 3.7, the following significance thresholds (2-tailed) apply to absolute values of r (and beta): $r > .030$, $p \leq .05$; $r > .040$, $p \leq .01$; $r > .051$, $p \leq .001$.

^bBecause dummy codings were used for the four regions, one of them had to be excluded from the regression analyses. The North Central region showed the smallest departures from the average for the nation as a whole, and thus was selected for exclusion. (The beta values would have been very similar if either the South or the Northeast had been excluded.)

Thus the race differences shown in the present data may somewhat exaggerate the underlying reality.

Parents' educational level, a mean of father's and mother's educational attainment, shows little association with drug use. There is a very slight negative correlation with cigarette smoking ($r = -.07$); however, the results of the regression analysis suggest that any negative effect occurs "via" other dimensions such as grades and college plans (since the regression coefficient for parents' education is essentially zero). Parental education actually shows a very slight positive relationship with alcohol and marijuana use, which does not entirely disappear when other factors are included in the equation. Nevertheless, all of these associations are quite small, and the appropriate conclusion to be drawn is that the drug use of high school seniors is not very strongly related to the parents' education.

Number of parents in the home reflects the degree of available parental control and involvement, constructive

adult modeling, and perhaps past psychological trauma associated with a "broken" home.* Seniors who are not living with two parents are slightly more likely than others to be cigarette smokers and to use marijuana and somewhat more likely to use other illicit drugs. These relationships are fairly small to begin with, but they are not substantially affected when other factors are included in the regression equation, suggesting that this variable does not operate "through" the others in the set.

Region and urbanicity are both related to drug use, as we have reported in some detail elsewhere.^{6, 7, 37} Briefly: young people living in the Northeast are above average on the four categories of drug use analyzed here; those living in the South are below average on all except cigarette use; those in the West are below average in cigarette and alcohol

*The number of parents in the home is a better predictor of substance use than a dichotomous index of "broken home."

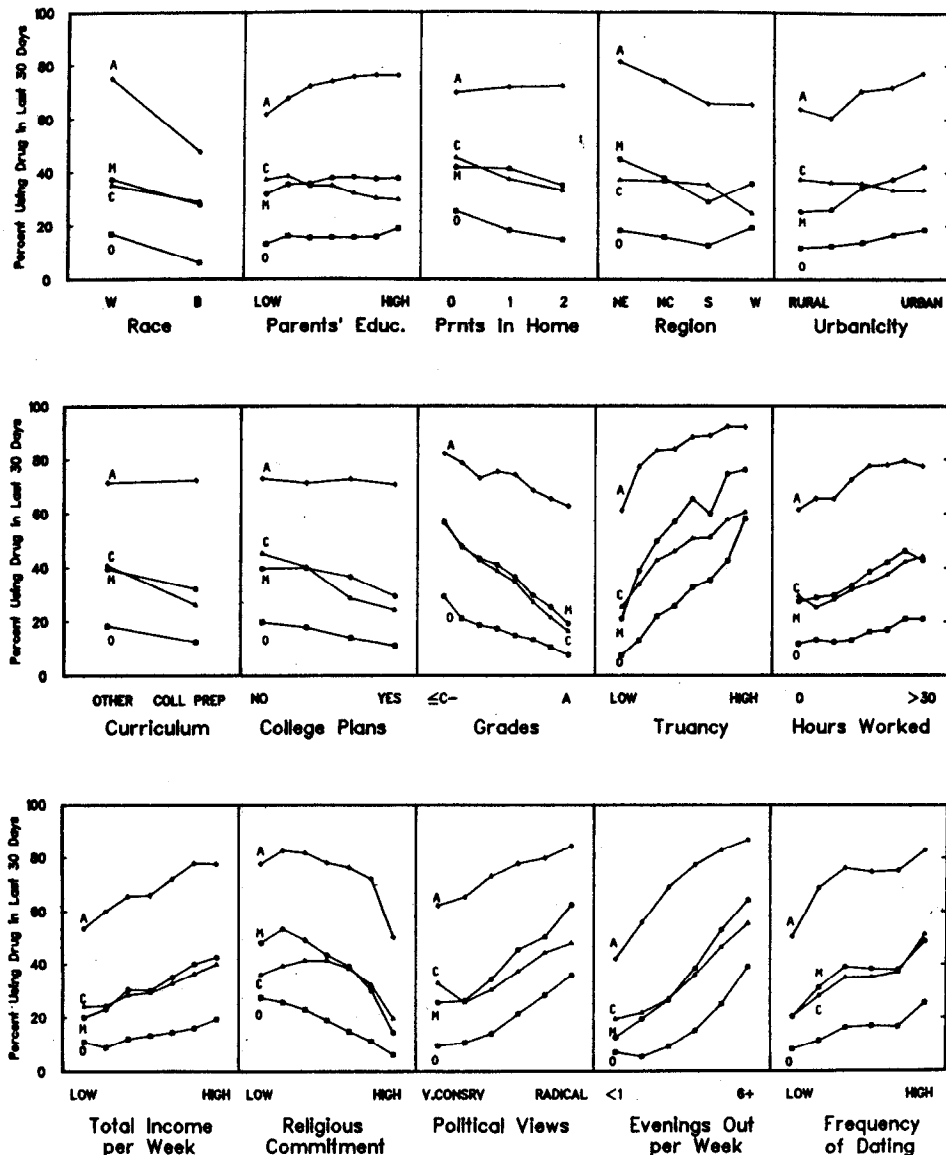


FIGURE 2—Thirty-Day Prevalence of the Use of Cigarettes (C), Alcohol (A), Marijuana (M), and Other Illicit Drugs (O) Related to Background and Lifestyle Variables: Seniors, 1979

use; and those in the North Central region are just about average along all four drug use dimensions. The pattern of lower than average use of cigarettes and alcohol in the West is not at all diminished by controlling for other variables in the regression analyses; however, the other regional differences in drug use are considerably diminished by such controls.

The measure of urbanicity** shows modest positive correlations with use of alcohol and use of marijuana, and a very small correlation with the use of other illicit drugs. Note in

**The urbanicity measure employed here distinguishes among those living in very large metropolitan areas (coded 5), those living in other metropolitan areas (coded 4), and those not currently living in a metropolitan area. The last group is further subdivided into those who grew up mostly on a farm (coded 1), those who grew up in the country but not on a farm (coded 2), and all others (coded 3).

Table 2 that the introduction of other factors into the predictive equation largely eliminates the urbanicity relationships. More extensive regression analyses, documented elsewhere,³⁹ indicate that controls limited to other background factors do not appreciably affect the urbanicity relationship with drug use. Instead, it appears that the introduction of other lifestyle and experience factors is what leads to the reduced urbanicity coefficient.

College plans and curriculum are two of the most frequently studied aspects of secondary school experience. The measure of plans asks the likelihood of completing four years of college.*** College plans, and enrollment in the college preparatory curriculum, both show modest negative correlations with use of marijuana and use of other illicit drugs.

***The following continuum is used: Definitely won't (coded 1), Probably won't, Probably will, Definitely will (coded 4).

These measures of commitment to higher education show stronger negative correlations with cigarette smoking. All of these relationships drop considerably in strength when the other predictors are entered into a multivariate analysis with college plans. More extensive data relating college plans to drug use are available elsewhere;^{6, 7} one specific finding of interest is that the number of occasions involving heavy drinking is much lower among the college bound, as is daily use of marijuana and the frequent use of most other drugs.

Self-reported grades during high school correlate negatively with all four measures of drug use, and the relationships are stronger than those for college plans or curriculum. Clearly the more academically oriented are less involved in either licit or illicit substance use; and the dramatic differences in smoking rates remain important in the multivariate analysis, as well.

Truancy—self-reported frequency of cutting classes or skipping whole days of school during the past four weeks—shows the strongest links with drug use of any of the educational experiences and behaviors that were examined.

When the four dimensions of educational experience and behaviors are included together in multiple regression analyses (see Table 2), truancy generally shows the strongest effect, with classroom grades a distant second (except for cigarette use, where the two predictors are about equal). Both are generally regarded as manifestations of the more general construct of social deviance and seem likely to share some of the same more basic causes.²³

Number of hours worked per week by seniors, and their *total weekly income*, are both positively linked to all four classes of substance use. It might be speculated that the amount of time worked relates to drug use only because it contributes to income, which provides a means of paying for drugs. But if that were entirely true, then regression analyses should show no predictive value from hours worked, once income is included in the equation. As the data in Table 2 indicate, however, both variables continue to make some contribution to the equation, even when all other predictors are included.‡

Religious commitment has often been found to relate to drug use.^{4, 15, 23, 35} Our measure of this variable, a mean of two items dealing with the self-rated importance of religion in one's life and frequency of attendance at services, is among the strongest correlates of the several dimensions of drug use shown in Table 2. It also remains one of the strongest predictors in multivariate analyses. As would be expected from previous work, those most involved with religion are least likely to be involved with either licit or illicit drug use.

Preliminary analyses have been undertaken to explore drug use patterns linked to specific religious and denominational preferences. Although some differences emerged, particularly with respect to alcohol use, the more general measure of commitment shows consistently stronger effects.³⁹

‡The fact that hours and income are highly correlated ($r = .69$) means that the regression coefficient for each is distinctly smaller than would be the case if the other were not included in the equation.

Political views have also been found in other studies to correlate with drug use.^{4, 18, 23} One such correlate in the present study is a question asking respondents to locate themselves on the following continuum: Very conservative (coded 1), Conservative, Moderate, Liberal, Very liberal, Radical (coded 6). Those toward the conservative end of the scale are less likely to use drugs, particularly marijuana.‡‡

Social lifestyles—as reflected in frequency of going out on evenings for fun and recreation, and frequency of dating—also are correlated with drug use. As Table 2 indicates, the measure of evenings out shows fairly substantial positive correlations with the four dimensions of drug use, particularly use of alcohol and marijuana. The linkage between dating and drug use is also positive, but not as strong.

Naturally, the two dimensions—evenings out and dating—are correlated with each other, but the overlap is not extreme ($r = .38$ for seniors in 1979). In the multiple regression analyses reported in Table 2, frequency of going out proves to be the far more important predictor; the relationship with frequency of dating is almost entirely eclipsed for the illicit drugs, but not for the licit drugs.

Trends in the Correlates of Drug Use

Mean scores on each of the "predictor" variables discussed above were examined for the senior classes of 1975 through 1979 in order to see whether there is evidence of any shifts in background and lifestyle factors (data not shown). In general, the picture which emerged is one of relative stability, with only one really noteworthy exception. The average amount of time spent working on a job has been increasing steadily since 1975, partly because more seniors are working (a shift from 72 per cent to 80 per cent) and partly because they are working slightly longer hours (e.g., a shift from 28 per cent to 35 per cent reporting 20 or more hours per week). A large increase appeared also in income, reflecting inflation as well as the increase in hours worked. Inflation notwithstanding, it is impressive to note that the proportion of seniors earning more than \$50 per week from working on a job rose from 14 per cent in 1975 to 34 per cent in 1979.

To determine whether there were any shifts in size and/or direction of *correlations* between the various "predictors" and the measures of drug use, the same correlational and regression analyses reported in Table 2 for the class of 1979 were also carried out for the other classes from 1975 through 1978.‡‡‡ A comparison of these other analyses with the data shown in Table 2 revealed a high degree of stability rather than change in patterns of correlation. The largest shift in correlation (from $-.02$ in 1975 to $+.07$ in 1979) re-

‡‡Another measure of political views asks respondents to identify themselves with one of the two major parties; however, only a minority of seniors are willing to rate themselves as either Republican or Democrat, whereas the majority describe themselves as independent or undecided. Analyses of the minority who are willing to place themselves in either of the major parties show no appreciable correlation between party preference and drug use.³⁹ Thus, the conservative/liberal/radical relationship with drug use described above seems to be quite unrelated to any conservative-Republican vs liberal-Democrat continuum.

‡‡‡The correlation matrices and regression analyses are reported elsewhere.³⁹

flects the changing pattern of sex differences in cigarette use discussed earlier. A detailed examination of the other correlations for 1975 through 1979 suggests that there may be additional trends which are genuine, although relatively small.* Nevertheless, the conclusion remains that the pattern of correlational findings for the four categories of drugs we have focused on is one of considerable stability during this historical period, rather than one of change.

The historical period can be extended another half decade by considering Johnston's analysis of data from the Youth in Transition project—a nationwide longitudinal study of males from the high school class of 1969.^{18, 19} The earlier study is sufficiently similar to the present one to permit general comparisons in patterns of correlation. One important contrast involves racial differences in drug use; Black males in the class of 1969 did not report less drug use than Whites, whereas in the classes of 1975–1979 Blacks (both male and female) reported less use on all four dimensions. Although methodological differences complicate comparisons between the two studies, the data suggest that a genuine trend in racial differences has taken place over the past decade, with Whites now surpassing Blacks in drug use. The work of O'Donnell, *et al*, lends support to this interpretation.³⁰

Another interesting set of trends over the past decade involves regional differences in drug use; specifically, it appears that the West may represent a "leading indicator" of drug use trends in the other regions. In 1969, the West was already lower than any other region in cigarette use by young people (although not in use by adults). Now cigarette use is dipping among seniors in all four regions of the country. In 1969, seniors in the West led in marijuana and other illicit drug use; but by 1979 other regions had largely caught up with the West or surpassed it. Currently, use of cocaine is far above average in the West, and it might be predicted that other regions will again follow a catch-up pattern.

Finally, there is some suggestion that the relationship between socioeconomic level and student alcohol use during high school has shifted since 1969 from zero or very slightly negative to slightly positive as of 1979.

The above shifts in correlations with drug use represent the largest we uncovered in the comparison of the current study with the earlier Youth in Transition work. The more important observation is that for the most part the relationships are essentially similar, again suggesting that there has been a good deal of stability in most of these correlates of drug use during the 1970s.

Cocaine use would appear to represent one important exception to our general finding of recent stability in correlations involving drug use. Although Table 2 does not include separate columns of data for each of the illicit drugs other than marijuana, the analyses were carried out and the results carefully examined for shifts from 1975 to 1979. Most of the

drugs showed little change in correlation pattern; however, relationships with cocaine use grew substantially stronger during the late 1970s. For example, among the "predictor" variables in Table 2, the strongest correlate of cocaine use (frequency of use during the past year) is truancy; correlation values rose from .18 in 1975 to .28 in 1979 ($p < .001$). The picture that emerges is not difficult to interpret. As cocaine has increased in popularity it has also increased in predictability. The same sort of background and lifestyle factors which consistently correlate with use of other drugs have shown increasingly close connections with cocaine use. It thus seems clear that certain types of individuals are likely to use drugs, but *which* drug they use depends in part on what is currently fashionable and available. (This is entirely consistent with the assertion of Jessor and colleagues^{15, 16, 44} that across a fairly broad range of adolescent problem behaviors, including drug use, the pattern of psychosocial risk should be similar.)

Predictability of Drug Use

The multiple R and R² values in Table 2 indicate the overall "predictability" of each of the four measures of drug use. These statistics should not be overinterpreted, since they represent nothing more than the relationship attributable to the particular set of variables selected for inclusion in this analysis. Had the analysis been limited to background and demographic characteristics, the multiple correlations would all have been much lower. On the other hand, had other factors such as friends' use of drugs been included, the multiple correlations would have been a good deal higher.⁴⁴ With these limitations clearly in mind, one can see that the multiple correlations are fairly substantial for this set of predictors, particularly in predicting alcohol use ($R_{adj.} = .56$) and marijuana use ($R_{adj.} = .55$).

A further observation is that usage levels of the licit drugs—cigarettes and alcohol—show extremely stable levels of multiple correlation over the five senior classes under study; none of the multiple-R values for 1975–1978 differed by as much as .02 from the values for 1979 shown in Table 2. But for the illicit drugs there are some indications of an increase in predictability. In the case of marijuana, the multiple correlations shifted slightly (but non-significantly) upward. In the case of other illicit drug use the shift upward was a bit more gradual and was just large enough to be considered statistically significant; multiple-R (adjusted) values rose from .39 in 1975 to .44 in 1979 ($p < .05$). Much of the upward shift in the multiple correlation predicting to the index of other illicit drug use is attributable to the increased predictability of cocaine use. The multiple-R (adjusted) values for annual frequency of cocaine use rose sharply from .25 in 1975 to .36 in 1979, thus doubling the explained variance—from .063 to .127 ($p < .001$).

Discussion

This analysis has shown that a number of background, experience, and lifestyle factors relate consistently to the use of licit as well as illicit drugs. The present report is not

*For example, the correlation between religious commitment and alcohol use shifted from $-.33$ in 1975 to $-.26$ in 1979 ($p < .01$). A similar, although smaller, shift occurred for marijuana; its correlation with religious commitment dropped from $-.33$ to $-.29$. And the association between hours worked and use of marijuana increased from $.10$ in 1975 to $.16$ in 1979 ($p < .05$).

unique in exploring many of these dimensions; rather, its special contributions include documenting the relationships for a broad spectrum of American adolescents, considering these relationships in combination, and examining the ways in which the patterns have or have not been changing during the past half decade or longer.

Among the variables which proved most important in the multivariate analyses, three stand out in predicting all types of substance use: truancy, number of evenings out for recreation, and religious commitment. Interestingly, all three have to do with the degree to which a young person is under the direct influence and/or supervision of adult-run institutions—the school, the home, and the church. Those who most avoid such influence are also the most likely to be involved in all forms of substance use. For somewhat similar reasons one might expect hours worked on a job to have shown a negative relationship with substance use, but such is not the case. The positive relationship between drug use and hours worked is no doubt partly due to income and an enhanced ability to buy drugs. But an additional explanation may be that many—perhaps most—of the jobs high school students hold do not, in fact, immerse them in a predominantly adult environment; instead, many students find themselves surrounded by other young workers, including some slightly older and thus more experienced in the use of drugs.^{2, 9}

Although most of the above *correlational* findings have remained fairly stable from 1975 through 1979, that same short interval has witnessed several shifts in the *level* of drug use. There has been a peaking and subsequent decline in cigarette use, a continued rise and perhaps a leveling off in marijuana use, a rapid rise in the (still infrequent) use of cocaine, and relatively little change in use of most other illicit drugs or of alcohol. On the other hand, the correlates of drug use examined in this paper have not shifted substantially, except for a rise in working time and earnings, and a decline in liberal and radical political views (two shifts which would be expected to cancel each other in terms of effects on drug use). We are struck by the extent to which the several trends summarized above seem *not* to be connected. The recent rise in marijuana use, for example, does not appear to have led to an overall increase in poor grades and truancy, or a drift away from religious values. And, contrary to the "stepping stone" hypothesis, the rise in marijuana use has not been accompanied by an overall rise in the proportions who go on to try other illicit drugs.** These observations based on aggregate data are not meant to imply that there are no undesirable consequences for those individuals who use marijuana or other illicit drugs.

We believe that some individuals seem especially disposed toward deviant or "problem" behavior.^{15, 20, 35, 44} However, the particular forms of behavior chosen vary over different historical periods (as well as from one school or region to another). In the 1960s and 1970s illicit drug use emerged as an increasingly "popular" form of deviance; so instead of simply smoking cigarettes and using alcohol,

many of today's teenagers also use marijuana, and some use other illicit drugs. The emerging pattern of relationships with the use of cocaine may illustrate our point particularly well. In 1975, cocaine use was low and was not very strongly correlated with the background and lifestyle factors treated in this report. By 1979, usage levels were higher and the correlations were much stronger; however, the *patterns* of correlation were the familiar ones consistently in evidence for alcohol, marijuana, and other illicit drugs taken as a group. In other words, the kinds of young people most "at risk" tend to remain much the same, while the kinds and amounts of substances used shift somewhat from year to year.

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**For further discussion of the limitations of the "stepping stone" hypothesis, see Grinspoon⁴⁵ and Johnson.¹⁷

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APPENDIX

Description of Drug Use Measures

Cigarette use is measured for only two intervals, lifetime and 30 days. The lifetime measure asks "Have you ever smoked cigarettes?" and provides the following response scale (coded 1 through 5 respectively): Never, Once or twice, Occasionally but not regularly, Regularly in the past, Regularly now. The other measure of cigarette use asks "How frequently have you smoked cigarettes during the past 30 days?" and provides the following response alternatives (coded 1 through 7 respectively): Not at all, Less than one cigarette per day, One to five cigarettes per day, About one-half pack per day, About one pack per day, About one and one-half packs per day, Two packs or more per day.

Alcohol use is measured using a question series which first asks "Have you ever had any beer, wine, or liquor to drink?" and then (for those who have) asks "On how many occasions have you had alcoholic beverages to drink . . . in your lifetime? . . . during the last 12 months? . . . during the last 30 days?" The following response scale (coded 1 through 7) is provided for each of the three time intervals: 0 occasions, 1-2, 3-5, 6-9, 10-19, 20-39, 40 or more. Note that from the second category onward the scale is roughly logarithmic—each new level is about double the previous one. (Those who respond to the initial question that they have never had beer, wine, or liquor to drink are coded "0 occasions" on the three subsequent questions.)

Marijuana use is actually a measure of the use of mari-

juana and/or hashish. The question asks "On how many occasions (if any) have you used marijuana (grass, pot) or hashish (hash, hash oil) . . . in your lifetime? . . . during the last 12 months? . . . during the last 30 days?" using the same seven-category response scale as described above for alcohol.

Other illicit drug use is based on responses to a series of questions using an identical format to that described above for marijuana, and dealing with each of the following nine categories of illicitly used drugs: LSD, other psychedelics, cocaine, amphetamines, tranquilizers, methaqualone, barbiturates, heroin, and other narcotics. For the psychotherapeutic classes of drugs, the question wording includes

the statement "without a doctor telling you to take them" so as to ensure that the reference is limited to use which is not medically supervised. Two dichotomous measures of other illicit drug use are employed in the present report, one based on use during the last 12 months and the other based on use during the last 30 days; for each of the two time intervals, any use of an illicit drug in the above nine categories is scored 1, and no use is scored 0.*

*More detailed scales of other illicit drug use would produce slightly stronger correlations; however, for present purposes the less complicated dichotomies seem more appropriate.

*Daily (or near-daily) use is defined as 20 or more occasions during the last 30 days.