

Drug Use Among College Undergraduates: Current Use and 10-Year Trends

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Abstract

A random sample of 10% of the undergraduate student body at a rural New England university were surveyed as to their use of drugs in 1987. Over 87% of the surveyed students returned questionnaires. Results indicated that alcohol is clearly the "drug of choice" on the campus, and the second most used drug is marijuana. The 1987 survey findings were also compared to similar studies conducted on the campus in 1977 and 1983. Over the decade there has been a decrease in daily, weekly, and monthly

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use of marijuana. Cocaine use was greatest in the 1983 survey, but the 1987 figures were still somewhat higher than those of 1977. Hallucinogen use has remained low across all three observation points. Students indicating they had substance-dependent parents showed more use of cocaine, "ecstasy," and sedative-hypnotic drugs than their fellow students.

The use of drugs on college and university campuses has been the subject of multiple investigations over the last 25 years. Major studies have indicated that illicit drug use escalated dramatically from the mid-1960s through the mid-1970s, then stabilized in the late 1970s, and then decreased somewhat in the 1980s (Anker, Milman, Kahan, and Valenti, 1971; Blum, 1969a, 1969b; Chervin and Martinez, 1987; Dvorak, 1972; Garfield and Garfield, 1973; Girdano and Girdano, 1976; Johnston, O'Malley, and Bachman, 1987; Kopplin, Greenfield, and Wong, 1977; Wechsler and McFadden, 1979). These studies also indicate that alcohol use has remained relatively constant over this time span.

While the pronounced trends are evident, subtle trends in illicit drug use are somewhat more difficult to discern because of variations in methodology from study to study. Anker, Milman, Kahan, and Valenti (1971) have noted the differences among drug studies with respect to descriptions of the intensity and frequency of use, the format in which the data are presented, and the number of substances that are investigated. The literature on alcohol use is even more problematic, leading to difficulties in discerning trends in college drinking (Meilman, Stone, Gaylor, and Turco, 1990; Temple, 1986; Greenfield, 1986; Berkowitz and Perkins, 1986). For these reasons, studies which ask the same questions about the same substances, and employing the same methodology, are especially important in examining the patterns.

That is what we attempted to do as we assessed drug use patterns on campus. A careful study was undertaken and an effort was made to construct the study in such a way that the findings would be comparable to other research, so that we could examine trends over time in one collegiate setting. The present report focuses on substances other than alcohol but provides some data about the use of alcohol, for comparison purposes. Extensive analysis of the data regarding alcohol use has been reported previously (Meilman, Stone, Gaylor, and Turco, 1990).

METHOD

Setting and Subjects. This study was conducted at a small, private, highly selective liberal arts university located in a rural section of New England. Four hundred students, divided equally among the undergraduate classes, were randomly selected. This represented 10% of the undergraduate enrollment.

Instrument. The 1987 Health Service Survey of Alcohol and Drug Use was developed in order to investigate the nature and extent of alcohol and drug use

among undergraduates. The questionnaire included items regarding the frequency of substance use from Wechsler and McFadden's (1979) study of 34 New England colleges and universities. In addition, questions regarding sex, age, class year in college, race, and drug-related difficulties were included.

Procedure. The survey was carefully administered in order to obtain the greatest possible return rate. The questionnaire itself consisted of only 39 objective questions in order to limit the time demand and thereby ensure a higher rate of response. The survey questionnaire was anonymous and was returned separately from a numbered post card so that students could indicate that they had responded but at the same time could protect their anonymity. Two follow-up mailings, one of which contained a one dollar bill as an incentive, were sent to nonresponders.

Three hundred fifty questionnaires were completed and returned. One questionnaire was unusable, leaving 349 usable responses, for a response rate of 87.25%. This is a higher return rate than any previously reported mailed survey. Data obtained from the questionnaires were double-entered into the computer in order to assure accuracy.

Wechsler and McFadden (1977) analyzed the data from their larger New England study (Wechsler and McFadden, 1979) for the particular campus in question, so that direct comparisons with 1977 data are possible. They sampled 300 undergraduates, of whom 76.7% returned questionnaires. Six years later, Stone (1983) sampled 20% of the undergraduates on campus, stratified by gender and class, and obtained a response rate of 70.5%. Thus, three observation points are available over a 10-year period.

RESULTS

Sample Demographics. The sample consisted of 38.5% females and 60.5% males, which reflects the enrollment pattern on campus. Three students (0.9%) did not provide gender information. Subjects ranged in age from 17 to 22 years, with 17-year-olds comprising 0.6% of the sample; 18-year-olds, 13.2% of the sample; 19-year-olds, 23.8%; 20-year-olds, 22.9%; 21-year-olds, 26.4%; and 22-year-olds, 12.3%. Three students (0.9%) did not provide their ages. Class membership consisted of freshmen, 25.5%; sophomores, 25.9%; juniors, 22.4%; and seniors, 24.5%. Six students (1.7%) did not provide information regarding class membership. The sample was 87.6% Caucasian, with other ethnic groups (Asian, Black, Latino/Hispanic, Native American, and "other") making up 10.4% of the sample. Seven students (2.0%) did not provide information regarding their ethnic group.

Frequency of Drug Use. Table 1 describes the frequency with which students consume alcohol and various illegal drugs, as measured in 1987. As can be seen, alcohol is clearly the drug of choice on the campus in question, with the second-choice drug—marijuana—trailing far behind. Among the six frequencies of use listed in Table 1, the median value for alcohol is "once a week or more," while the

Table 1

Frequency of Drug Use in 1987 Expressed as a Percentage of Students, Listed by Drug

Drug	Frequency (%)					Never
	Daily or almost daily	Once a week or more ^a	Once a month or more ^a	At least once in the last year ^a	Not in the last year	
Alcohol	4.7	62.5	20.3	9.3	1.2	1.7
Marijuana	1.5	3.2	11.0	28.5	12.5	43.3
Cocaine (all forms)	0.0	0.3	1.4	11.0	8.4	78.8
Crack	0.0	0.0	0.0	0.3	0.9	98.8
Ecstasy	0.0	0.0	0.3	5.5	6.1	88.1
Mushrooms	0.0	0.0	0.3	8.7	7.0	84.1
LSD	0.0	0.0	0.0	4.1	1.7	94.2
Amphetamines	0.0	0.0	0.3	1.4	4.6	93.6
Sedative-hypnotics	0.0	0.0	0.3	1.7	4.1	93.9

^aThe exact wordings were as follows: Once a week or more (but less than daily); Once a month or more (but less than weekly); Less than once a month, but at least once during the past 12 months.

median value for marijuana is "not in the last year." Table 2 corroborates the finding that alcohol is the drug of choice on the campus. Students were asked to indicate how often the majority of their friends "get intoxicated on alcohol" or "get high on illegal drugs." As can be seen, the modal value for alcohol is "more than once a week," while the modal value for illegal drugs is "rarely."

Table 3 describes the frequency of marijuana use (including hashish) over time along with comparison data from the 1977 study by Wechsler and McFadden (1977) and the 1983 study conducted by Stone (1983) on the same campus, and data from the 1977 study by Wechsler and McFadden (1979) at 34 New England colleges and universities. As can be seen, daily and weekly use of marijuana has decreased over the three observation points.

Table 4 describes the frequency of cocaine use (all forms), with comparison data from the 1977 and 1983 studies mentioned above. Cocaine use appears to have peaked during the 1983 observation point. An age effect was noted for cocaine, with 4.4% of 18-year-olds, 24.1% of 19-year-olds, 13.8% of 20-year-olds, 29.4%

Table 2

Frequency of Friends' Intoxication on Alcohol and Illegal Drugs

Frequency	"How often do the majority of your friends . . ." (%)	
	"Get intoxicated on alcohol?"	"Get high on illegal drugs?"
Daily	0.0	0.3
More than once a week	32.1	6.1
Once a week	30.0	4.1
More than once a month	18.7	9.4
Once a month	9.0	11.4
Rarely	7.3	43.3
Never	1.7	19.6
Don't know	1.2	5.8

Table 3

Frequency of Marijuana Use

Frequency	Percentage in each year		
	1977	1983	1987
Never	34.3 [32.0] ^a	46.6	43.3
Not in the last year ^b	8.7 [9.2]	12.5	12.5
Less than once a month but at least once in the last year	16.5 [17.8]	24.3	28.5
Once a month or more but less than weekly	23.0 [18.1]	10.0	11.0
Once a week or more but less than daily	10.4 [15.0]	4.6	3.2
Daily or almost daily	6.5 [7.9]	2.0	1.5

^aFigures in brackets derive from Wechsler and McFadden's (1979) study of 34 New England colleges and universities and are listed for comparison purposes.

^bIn the 1983 Stone study, the question was asked slightly differently. Instead of "not in the last year," the item was worded, "I used to but quit."

Table 4
Frequency of Cocaine Use (including crack)

Frequency	Percentage in each year		
	1977	1983	1987
Never	90.0 [85.0] ^a	71.4	78.8
Not in the last year ^b	4.3 [4.2]	2.7	8.4
Less than once a month but at least once in the last year	5.2 [8.5]	17.0	11.0
Once a month or more but less than weekly	0.8 [2.0]	7.1	1.4
Once a week or more but less than daily	0.0 { [0.2] }	1.6	0.3
Daily or almost daily	0.0 { [0.2] }	0.2	0.0

^aFigures in brackets derive from Wechsler and McFadden's (1979) study of 34 New England colleges and universities and are listed for comparison purposes.

^bIn the 1983 Stone study, the question was asked slightly differently. Instead of "not in the last year," the item was worded, "I used to but quit."

of 21-year-olds, and 31.0% of 22-year-olds reporting having "ever used" cocaine ($\chi^2 = 16.892$, $df = 4$, $p < .002$).

Table 5 describes hallucinogen use across the three time periods, and use appears to have remained relatively consistent throughout the decade covered by this report. There is some increase in the category "less than once a month but more than once a year." This increase is slightly greater if ecstasy, an amphetamine with mildly hallucinogenic properties, is added to the figures.

Sex differences were noted with respect to two particular hallucinogens. With LSD, 8.1% of the males indicated that had "ever used" this drug, as compared with 2.2% of the females ($\chi^2 = 5.190$, $df = 1$, $p < .023$). "Ever used" figures for hallucinogenic mushrooms were 20.5% for males as opposed to 8.9% for females ($\chi^2 = 8.233$, $df = 1$, $p < .004$).

An age effect was noted for hallucinogenic mushrooms, with older students more likely to have "ever used" this substance than younger students ($\chi^2 = 16.017$, $df = 4$, $p < .003$). Specifically, 4.4% of 18-year-olds, 13.3% of 19-year-olds, 10.0% of 20-year-olds, 25.0% of 21-year-olds, and 26.2% of 22-year-olds reported having tried mushrooms. Similarly, there was an effect by year in school, with 9.0% of

Table 5
Frequency of Hallucinogen Use, Across Time (LSD, mushrooms, psilocybin, mescaline)

Frequency	Percentage in each year		
	1977	1983	1987
Never	84.8 [83.3] ^a	87.7	83.3 (80.6) ^a
Not in the last year ^b	9.1 [9.2]	3.2	6.1 (7.2)
Less than once a month but at least once in the last year	5.2 [6.3]	8.6	9.9 (11.9)
Once a month or more but less than weekly	0.9 [0.9]	0.0	0.3 (0.3)
Once a week or more but less than daily	0.0 [0.4]	0.2	0.0 (0.0)
Daily or almost daily	0.0 [0.04]	0.0	0.0 (0.0)

^aFigures in brackets derive from Wechsler and McFadden's (1979) study of 34 New England colleges and universities and are listed for comparison purposes. Figures in parentheses include the drug "ecstasy," a mildly hallucinogenic amphetamine. It is not clear whether ecstasy should be considered a hallucinogen, and so figures for 1987 are provided both with and without this new drug.

^bIn the 1983 study, the question was worded slightly differently, i.e., "I used to but quit."

freshmen, 11.1% of sophomores, 12.8% of juniors, and 32.1% of seniors reporting having "ever used" mushrooms ($\chi^2 = 21.585$, $df = 3$, $p < .0001$).

Typology of Drug Use. Data regarding frequency of drug use were examined by means of a cluster analysis procedure (Maxwell, 1977, pp. 136-143) to determine if there were meaningful subsets of students' drug use. Ordinary Euclidian distance was used as the clustering measure, with the data being analyzed with the statistical package from SAS (SAS Institute, 1985). In order to prepare the data for this procedure, the categories describing frequency of use were recoded into an approximate number of days per year that a student might have used a drug. For example, "daily or almost daily" use was recoded as 365, while "never" was recoded as 0.

A five-cluster solution provided the most meaningful description of the data. Cluster 1 ($n = 322$) primarily consisted of students who were weekly users of alcohol with little or no use of other drugs. Cluster 2 ($n = 15$) primarily consisted of daily users of alcohol with some occasional use of marijuana. Cluster 3 ($n = 4$) primarily consisted of daily users of marijuana who also used alcohol weekly and

other drugs on a less frequent basis. Clusters 4 and 5 consisted of single outlying observations representing patterns of extensive polydrug abuse.

Parental Substance Dependency. Alcohol dependency in a parent was reported by 9.0% of the students, drug dependency by 0.9%. In analyses described below, the categories alcohol dependency and drug dependency were combined into a new variable called substance dependency.

Chi-square analyses were conducted to determine if there were significant relationships between parental substance dependency and the respondents' own drug use histories. Of those students reporting parental substance dependency, 36.4% indicated that they had "ever used" cocaine, as compared with 19.6% of the other students ($\chi^2 = 5.050$, $df = 1$, $p < .025$). Of those students reporting parental substance dependency, 24.2% indicated that they had "ever used" ecstasy, as compared with 10.8% of the other students. The chi-square analysis was significant as shown by Fisher's exact test (2-tailed, $p < .043$). Of students with substance-dependent parents, 23.1% reported "ever using" sedative-hypnotic drugs (barbiturates, tranquilizers, sleeping pills), as compared with 5.5% of other students, with the chi-square analysis significant as shown by Fisher's exact test (2-tailed, $p < .039$). Analyses of "ever used" figures for the remaining substances listed in Table 1 were not significant.

Accidents. In terms of physical injuries, 10.7% of the students had been injured due to alcohol, and 1.7% due to other drugs; 12.1% reported that a member of their immediate family had been injured due to alcohol, 2.3% due to drugs; and 44.2% reported that a friend had been injured due to alcohol, 11.9% due to drugs.

Previous Use. Most of the students (82.9%) indicated that they had used alcohol before coming to college, as contrasted with 37.3% who said they had used illegal drugs.

DISCUSSION

This study represents a carefully administered survey of drug use on a college campus. Three mailings, a monetary reward for participation, and a guarantee of anonymity appear to have contributed to the high response rate. The survey was designed so that the data would be comparable to previous studies conducted on the campus, and double data entry helped to ensure accuracy. For these reasons, we believe that the results are representative of the undergraduate campus at the time the study was conducted.

The data indicate that alcohol is the drug of choice on the campus. The next most commonly used drug was marijuana, but the data indicate that its use did not approach the frequency with which students use alcohol. Use of other drugs is lower still, contrary to a commonly held impression on campus that use of some drugs is extensive. This appears to be an instance of Berkowitz and Perkins' (1987) finding that students perceive campus drug use as greater than it really is.

The cluster analysis enables us to establish meaningful typologies of drug use among the undergraduate sample. Five patterns of drug use emerged from the data. By way of comparison, Chervin and Martinez (1987) found two patterns of drug use in their data from Stanford—one was a pattern of combined marijuana, hallucinogen, cocaine, and "ecstasy" use; and the other was a pattern of combined alcohol and marijuana use. Given the relative void of information in the literature regarding drug use patterns, further studies of this phenomenon are clearly warranted.

The present study indicated that those subjects who report substance-dependent parents are at higher risk for cocaine, "ecstasy," and sedative-hypnotic drug use. These findings dovetail with Meilman, Stone, Gaylor, and Turco's (1990) finding that college students reporting alcohol-dependent parents are at higher risk for daily drinking. Clearly, this is an "at risk" group, and efforts should be made to target these students for drug and alcohol prevention work both before and during their years at college.

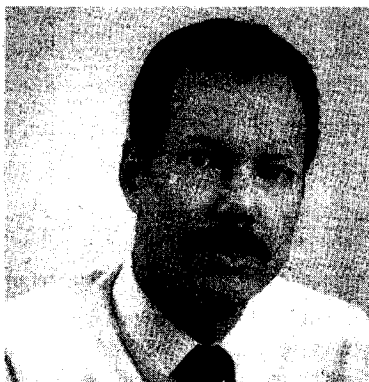
A study of this type has an inherent limitation in that estimates of substance use are subject to faulty recall (see Greenfield, 1986), denial, and/or exaggeration. Unfortunately, there is no way around this problem, unless one asks students to keep records, such as those used by Rabow and Neuman (1984). However, we are comparing the present data with earlier data collected in the same manner, and so it is unlikely that there was any differential bias operating in any particular year.

A survey of this type contributes to a larger picture of substance use patterns by delineating what is happening in a particular type of collegiate institution. Temple (1986) has called for more such studies with respect to alcohol, and we would echo this request with respect to other drugs, so that we can see what is happening in university environments of different size, location, and residential character.

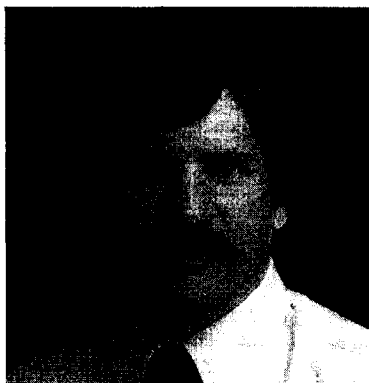
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REFERENCES

- ANKER, J.L., MILMAN, D.H., KAHAN, S.A., and VALENTI, C. Drug usage and related patterns of behavior in university students: 1. General survey and marihuana use. *Journal of the American College Health Association* 19: 178-186, 1971.
- BERKOWITZ, A.D., and PERKINS, H.W. Problem drinking among college students: A review of recent research. *Journal of American College Health* 35: 21-28, 1986.
- BERKOWITZ, A.D., and PERKINS, H.W. Perceived norms of substance abuse vs. reality. Paper presented at the Fund for the Improvement of Post Secondary Education Drug Prevention Program Workshop, Washington, DC, November 21-23, 1987.
- BLUM, R.H. Drugs on five campuses. In R.H. Blum and Associates (eds.), *Drugs II: Students and Drugs*. San Francisco: Jossey-Bass, 1969a, pp. 31-47.
- BLUM, R.H. Student characteristics and major drugs. In R.H. Blum and Associates (eds.), *Drugs II: Students and Drugs*. San Francisco: Jossey-Bass, 1969b, pp. 63-81.
- CHERVIN, D.D., and MARTINEZ, A.M. Survey on the health of Stanford students: Report to the board of trustees. Palo Alto: Cowell Student Health Center, Stanford University, 1987.
- DVORAK, E.J. A longitudinal study of nonmedical drug use among university students—A brief summary. *Journal of the American College Health Association* 20: 212-215, 1972.
- GARFIELD, M.D., and GARFIELD, E.F. A longitudinal study of drugs on a campus. *International Journal of the Addictions* 8(4): 599-611, 1973.
- GIRDANO, D.D., and GIRDANO, D.A. College drug use—A five-year survey. *Journal of the American College Health Association* 25: 117-119, 1976.
- GREENFIELD, T.K. Quantity per occasion and consequences of drinking: A reconsideration and recommendation. *International Journal of the Addictions* 21: 1059-1079, 1986.
- JOHNSTON, L.D., O'MALLEY, P.M., and BACHMAN, J.G. *National Trends in Drug Use and Related Factors Among American High School Students and Young Adults, 1975-86*. National Institute on Drug Abuse; Alcohol, Drug Abuse and Mental Health Administration; Public Health Service; U.S. Department of Health and Human Services; DHHS Publication No. (ADM) 87-1535. Washington, DC: U.S. Government Printing Office, 1987, pp. 1-13, 206.
- KOPPLIN, D.A., GREENFIELD, T.K., and WONG, H.Z. Changing patterns of substance use on campus: A four-year follow-up study. *International Journal of the Addictions* 12: 73-94, 1977.

- MAXWELL, A.E. *Multivariate Analysis in Behavioral Research*. New York: Wiley, 1977, pp. 136-143.
- MEILMAN, P.W., STONE, J.E., GAYLOR, M.S., and TURCO, J.H. Alcohol use among undergraduates: Current use and 10-year trends. *Journal of Studies on Alcohol* 51: 389-395, 1990.
- RABOW, J., and NEUMAN, C.A. Saturday night live: Chronicity of alcohol consumption among college students. *Substance and Alcohol Actions/Misuse* 5: 1-7, 1984.
- SAS INSTITUTE. *SAS Users Guide: Statistics*, Version 5 Edition. Cary, NC: SAS Institute, Inc., 1985.
- STONE, J.E. *A study of alcohol use by college undergraduates: Extent, correlates, and gender differences*. Unpublished doctoral dissertation, Florida Institute of Technology, 1983.
- TEMPLE, M. Trends in collegiate drinking in California, 1979-1984. *Journal of Studies on Alcohol* 47: 274-282, 1986.
- WECHSLER, H., and MC FADDEN, M. Unpublished data from the survey of drinking practices among students attending 34 New England colleges and universities. Boston, Massachusetts: The Medical Foundation, Inc., 1977.
- WECHSLER, H., and MC FADDEN, M. Drinking among college students in New England. *Journal of Studies on Alcohol* 40: 969-996, 1979.

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Personality Disorder Subtypes Among Cocaine and Opioid Addicts Using the Millon Clinical Multiaxial Inventory

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Abstract

Individuals with psychoactive substance dependence suffer from high rates of non-substance use psychiatric disorders. These disorders sometimes prove difficult to distinguish in clinical practice. The Millon Clinical Multiaxial Inventory (MCMI) is a relatively new assessment tool which purports to evaluate DSM-III Axis I and Axis II disorders. In the present study, the MCMI was administered to 73 opioid addicts and 37 cocaine addicts entering treatment. MCMI protocols were then sorted four times to identify: (1) subjects with psychotic disturbances, (2) subjects with affective disturbances, (3) subjects with severe personality disorders, and (4) basic personality disorder subtypes. The covariabilities of all four categories with drug of choice are presented and discussed. The covariabilities of the first three categories with the fourth are also presented and discussed. The MCMI appears to be a useful instrument for psychiatric diagnosis of opioid and cocaine addicts.