AMERICAN SOCIETY has defined all marijuana use as a problem, implying that those who use it are members of a deviant subculture. A number of recent surveys have shown, however, that marijuana smoking is extremely common among a wide variety of young people. Most such studies have estimated that the frequency of use among high school and college age youth ranges between 20 and 40 percent (1-3).

In a census tract survey Manheimer and associates (4) found that half the men and one-third of the women in the 18- to 24-year age range had used marijuana one or more times. The researchers found that while users' "values in general tend to be non-traditional," in most respects they were considered "reasonably conventional." In a survey of two eastern colleges Hogan and associates (3) found that 40.5 percent of the students had tried marijuana, but, as in other studies of this type, the average user was similar to the average nonuser.

It is also clear that casual or experimental use of marijuana is not regarded by young people themselves as particularly deviant or unusual. Batter suggests in unpublished data that when an intoxicant (e.g., alcohol or marijuana) is used by a significant number of people, it is the frequency of use that correlates with the degree of manifest psychopathology. In the case of heroin and intravenous methamphetamine, however, even casual use is associated with psychopathology. As in the alcohol model, where one out of 15 becomes a problem drinker, there are those who use and those who abuse marijuana.

The present study compares a group of frequent marijuana users to those who smoke casually. If there are "problem smokers" in the same way that there are "problem drinkers," they logically should be found among those whose pattern of marijuana use suggests that it has become a daily, structured part of their existence. This is not to equate the effects of marijuana and alcohol but rather to suggest that the motivation and sequelae of marijuana use may be very different for those who use the drug on an occasional basis than for those who are frequently intoxicated. Accordingly, we sought to differentiate heavy and casual marijuana
smokers by defining the extent and pattern of drug consumption, motivation—both past and present—for drug use, and the social and work adjustment in the two groups. Their relative psychic dependence on marijuana was also explored.

Future reports will describe differences in the marijuana experience (in the laboratory) for the "heavies" and "casuals." The present study examines questionnaire and interview data on 24 subjects, 12 of whom were casual (one to four times per month) and 12 of whom were frequent (20 to 30 times per month) users of marijuana.

Method

Drug use questionnaires were distributed to 91 men who had indicated they would be willing to participate in this research. Some volunteers came from contacts in the student community; others volunteered directly after a news release about the study. The questionnaires were used as both a screening device and a primary data source. They asked about use of marijuana, alcohol, hallucinogens, and amphetamines: in particular, the frequency and duration of use, the circumstances surrounding initiation, how each drug made the subjects feel, and their reasons for continuing or discontinuing its use.

From the 66 returned questionnaires we selected 24 subjects: 12 who smoked marijuana virtually every day and 12 who smoked it "casually," i.e., once a week or less. Subjects were excluded if they were under 21 or if their pattern of marijuana use fell between the two criteria. We attempted to match the two groups on LSD and amphetamine use, but, as will be shown later, this was not possible. The comparisons to be discussed, therefore, are actually between two groups who differ in multiple drug use.

Chosen subjects came to the laboratory to be interviewed by a psychiatrist. Further information was obtained about the frequency, duration, and motivation for marijuana use. The effects of the drug on thought processes, perception, memory, ideation, and verbal ability were specifically explored, in addition to the subjects' family history, life adjustment, and world view. Subjects were instructed to abstain from all drugs on the day of the interview. Each interview was scored by the psychiatrist conducting it and recorded on video tape.
Immediately following the interview each subject completed a battery of psychological tests including the Taylor Manifest Anxiety Scale, Personal Inventory of Psychological and Physiological Awareness, Buss-Durkee Hostility Scale, Bass Social Acquiescence Scale, the California F Scale (a measure of "authoritarianism"), and the Psychiatric Outpatient Mood Scale (which asks for self-ratings of anxiety, hostility, and depression and has been found useful in drug studies with neurotic populations). The entire session took about two hours, for which subjects were paid $5.

Results

Subject Groups Compared

The two groups were comparable in age (mean: 25 years), educational experience (mean: first-year graduate school level), racial distribution (11 white, one black), and the social class from which they came (Hollingshead and Redlich Class I and 2) (5).

Casual smokers were presently using marijuana one to four times per month compared with 20 to 30 times per month for the heavy users. The casual smokers' average age at first experience was 22.7 years compared to 20.4 years for the heavy users (p =NS). The latter group had been using the drug for an average of 4.4 years and for three of those years (range: six months to five years) had smoked virtually every day, indicating that daily use began an average of 16 months after initial contact with marijuana.

Other Drug Use

As we previously mentioned, our attempt to find heavy users of marijuana who employed no other drugs was unsuccessful. As table 1 illustrates, all of the heavy users had tried hallucinogens at least once and almost half had taken 25 or more "trips." In contrast, only two casual smokers had ever tried hallucinogens, and their combined experience totaled four occasions.'

A similar relationship exists with respect to oral amphetamines. Eleven of the 12 heavy
smokers had tried amphetamines, and seven had more than occasional experience with these drugs. All of the subjects had used alcohol, with no group differences in the frequency of their current use. None of the subjects had used heroin.

In attempting to determine if there was a pattern of progression in drug use, we compared the age at first experience with each of the four drugs for the 12 heavy users of marijuana.

As table 1 illustrates, alcohol was the first drug used in every case. The mean age at first experience was 15 years. In 11 of the 12 subjects the next drug used was marijuana. Amphetamines and hallucinogens followed in random order. A single heavy user had tried intravenous amphetamines on one occasion. The data confirm the findings of others (2, 6) that experience with marijuana generally precedes the use of hallucinogens. One would have to follow these subjects prospectively to determine whether they have an increased future risk of heroin or intravenous amphetamine use.

Nature of the Marijuana Experience

The interviews were in part structured to elicit descriptive material about what the marijuana experience was like for the subjects. A majority of both groups stressed the drug's pleasurable effects. All rated a typical experience as extremely or mildly pleasurable, and three-fourths had had no unpleasant experience with the drug.

Both heavy and casual users cited the drug's pleasurable effects. These effects included enhancement of perceptual awareness and an increased appreciation of art or music. Thought disruption, feelings of depersonalization, paranoid ideas, and impairment of recent memory were commonly experienced. In addition, three heavy users reported difficulty with recent memory when they were not under the influence of marijuana.

Differences were discernible between the two groups when one explored attitudes toward future drug use. Almost all heavy users were definite in their plans to continue smoking marijuana, whereas only half the casual smokers felt this way. In citing their reasons for continued drug use both groups stressed the drug's pleasurable effects, but a significantly
greater number of heavy users mentioned enhanced insight, the wish for union with some cosmic force, and the sense of harmony they felt while "high."

In describing a typical marijuana experience, ten of the 1/2 casual smokers reported they felt more friendly, involved, or agreeable. In contrast, only three of the heavy users said they felt this way (p <.02; Fisher Exact Test)! Significantly, seven of the heavy users felt they had a moderate or extreme psychological dependence on the drug; none of the casual users reported this. Manifestations of psychic dependence included anxiety when the supply was low, a self-perceived inability to get along in the world when not high, and the belief that marijuana was an integral part of life.

**Work Adjustment**

As previously mentioned, part of the interview was designed to elicit information about the subjects' social and work adjustment. Judgments about work adjustment were made by the interviewers on the basis of conventional standards. College graduates who had "dropped out" or worked at tasks far below their previous achievement level were judged to have a poor work adjustment. None who fell into this group appeared to be engaged in independent and/or creative activity. Despite similar educational background, racial distribution, and social class, the heavy drug users were judged to have a significantly poorer work adjustment than those who used drugs casually (p <.01; Fisher Exact Test). Heavy drug use was also correlated with a self-reported inability to master new problems.

Of the casual smokers, ten were students, one was a reporter, and one was a management consultant. Among the heavy smokers, four were students, four were employed at menial or mechanical tasks, and two were unemployed. A teacher and a free-lance writer completed the group.

**Social Adjustment**

The frequency of drug use was compared with the subjects' overall evaluation of their current relationships with peers. Heavy users expressed considerably more difficulty re
lating to women, although this factor did not reach statistical significance. Heavy users also often reported a fair or poor heterosexual adjustment.

Ps
ychological Testing

1. Hostility scores. The relationship between hostility scores and drug use was examined. Two measures of hostility were used. The Buss-Durkee Scale is a self-report of one's tendency to indulge frequently in aggressive behavior; no significant difference was found between the heavy and casual users of marijuana. The Psychiatric Outpatient Mood Scale (POMS), on the other hand, is an indicator of current mood. It was administered immediately following the interview. Heavy users, as a group, scored significantly higher than the casual users on the hostility factor of the POMS (p < .05; two-tailed t test). It is of special interest that all of the increase in hostility can be attributed to those seven subjects who described themselves as psychologically dependent on marijuana.

2. Other psychological tests. No significant differences were found between the two groups on any of the other psychological tests, although the POMS revealed a trend toward greater anxiety and depression among heavy users.

Discussion

We compared two groups of marijuana users who were comparable in age, educational background, social class, and racial distribution. Of the two groups, the casual smokers best represent the great majority of marijuana users.

The frequent smokers, on the other hand, while clearly differing from our sample of casual smokers, are probably not truly representative of the class of "marijuana abusers." The educational level of this group seems atypically high for the population at large, and there are undoubtedly other biases operating in the volunteering process (e.g., in individuals with more severe psychological impairment might be more reluctant to be evaluated). A more valid approximation of the characteristics associated with chronic marijuana use will probably have to come from the intensive study of nonvolunteer samples.
From what data we have, it is impossible to determine the frequency of daily use of marijuana in the general population. In a medical school survey Pillard, Meyer, and Fisher (1) found that 45 percent of the current freshman class had experimented with marijuana, yet none could be called heavy users by our criteria. We suggest further surveys to determine the true frequency of daily use.

The heavy users in our study demonstrated a notable pattern of marijuana consumption. Their frequency of use appeared to increase steadily from the date of onset until smoking had become a daily occurrence, usually within a 16-month period. Experimentation with amphetamines and hallucinogens was prominent among frequent smokers, and at the time of the study all but one had experimented with both drugs. Almost half the group have now used hallucinogens more than 25 times, some much more. Clearly, then, in our study heavy marijuana smokers are multiple drug takers, making such terms as "pothead" or "acidhead" of doubtful validity.

The casual smokers did not show a similar pattern. Their use of marijuana seemed more flexible. Their frequency of use thus far has not increased, and they abstain when circumstances dictate. Their experience with amphetamines was limited and with hallucinogens rare.

The data generally confirm the impression of other investigators (2, 3, 7, 8) that heavy marijuana use is frequently associated with use of more potent mind-altering agents. We emphasize that this does not implicate marijuana as a cause of amphetamine or hallucinogen use. Situational or personality factors could be the determinants of a multiple-drug-taking syndrome. Given this syndrome of multiple drug use and the preference of our subjects for marijuana, we attempted to differentiate the marijuana experiences of those who use it frequently from those who use it casually.

Drug effects reported often included thought disruption, depersonalization, impairment of recent memory, increased perceptual awareness, and paranoia—evenly distributed among the heavy and casual smokers. In terms of attitude toward the drug, however, the two groups differed considerably. All but one of the frequent smokers were definite in their plans to continue using the drug, while casual smokers were divided on this point.

When the reasons for continued drug use were explored, both groups cited the drug’s
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Written by Steven Mirin

pleasurable effects (i.e., euphoria, relaxation). It was chiefly the heavy users, however, who mentioned the search for insight and/or the wish for a sense of harmony or union as part of their motivation for continuing to take the drug. Keeler (9) has noted that this type of motivation for drug use is frequently associated with an increased incidence of manifest psychopathology. Bowers and associates (10) have found similar motives among frequent users of LSD and attribute them to "unsatisfied longings for interpersonal closeness and ... the need to feel."

Social adjustment in daily marijuana users was impaired when judged from a traditional psychiatric standpoint. Interpersonal relationships with women were frequently described as poor, and there was a trend toward a less satisfactory sexual adjustment in this group, a finding previously reported in chronic LSD users (8). One wonders whether the inability to get close to people and a subsequent "wish for fusion" (with persons or nature) provide the impetus for repetitive drug use in this group (10, 11). Welpton (12) has postulated that there is a need to "overcome despair and establish meaning in life" in those who abuse psychedelic drugs. The user of hallucinogens "attempts to experience intimacy by breaking down [body and ego] boundaries . . . through drug use."

One could postulate that for some marijuana users, the transient nature of the drug experience necessitates its repetition. Consequently, they lapse into a pattern of heavy and frequent use. More than half of our heavy users felt considerable psychic dependence on marijuana, and a similar number planned further hallucinogen use.

The nature of this study precludes comment upon the cause-and-effect relationship between heavy marijuana usage and current life style. Nevertheless, a description of the adjustment patterns of this group seems warranted. Despite the seemingly high level of scholastic attainment, many were performing functions well below their intellectual capability. Half were unemployed or working at menial or mechanical tasks; however, they generally said they were satisfied with what they were doing. In contrast, all but one of the casual smokers appeared to be doing well at school or work.

With a few exceptions, the heavy marijuana users were more disheveled in appearance and had an air of self-neglect. They were more difficult to understand, for they were often vague and tangential. Indeed, they appeared not unlike the chronic LSD users described by Blacker and associates (13) and the prisoner subjects of Williams and associates (14) in their laboratory study of chronic, prolonged marijuana use. As did these subjects, our heavy users displayed "a general lassitude and indifference ... carelessness in personal hygiene and lack of productive activity." Some of -our heavy users demonstrated aspects of the "amotivational syndrome" described by McGlothlin and West (7) and others (15, 16). It must be mentioned, however, that
there were exceptions to this picture, with some daily smokers restricting their intoxication to the evening while maintaining a high level of functioning during the day.

Two measures of hostility were included because there is much evidence that marijuana acts to influence hostile feelings and aggressive behavior. Allen and West (16) have suggested that marijuana may serve as “an effective medication for the relief of feelings of anger, resentment, and aggression.” They further suggest that the use of psychedelics to reduce aggression is a familiar concept for the street culture.

Hollister (17) has found that subjects' self-estimates of aggression diminish after their ingestion of 30 to 70 mg. of ,Y-tetrahydrocannabinol, the principal active component in marijuana. The Mayor's Committee on Marijuana (18) reported that in their subjects, acute marijuana use engendered feelings of self-assurance with a corresponding decrease in feelings of guilt, insecurity, and inadequacy. Under these conditions subjects were able to admit feeling more aggressive, but behaviorally they were quite placid. Other observations both in humans (19) and in animals (20-22) generally support the theory of the anti-hostility effect of marijuana.

In this study both the heavy and casual users had similar "trait" scores on the Buss-Durkee Hostility Scale. The POMS, on the other hand, reflects the subjects' mood at the moment they are taking the test. Here, heavy users showed significantly elevated hostility levels, that is, right after the psychiatric interview. What was there in the interview to account for this selective rise in hostility?

Possible explanations include the subjects' responses to the interview setting, the interviewers, or the interview material. It was noted that the highest hostility scores came from those heavy users who admitted psychic dependence on marijuana. These were also the subjects whose life styles differed markedly from those of the interviewers. Perhaps these factors, coupled with questions about work, social adjustment, and relationships with women, made our heavy users defensive and then hostile. The life styles of the casual users, in contrast, closely approximated the life styles of the interviewers and these subjects would be expected to be less defensive in this setting.

Summary
A certain percentage of the drug-using population readily falls into a pattern of frequent marijuana use, followed shortly by use of other drugs. Consequently, it is difficult to draw conclusions about heavy marijuana use per se, since what we observe here is a multiple drug abuse syndrome.

In any case, the marijuana experience appears to contain certain common denominators for both groups; these include a pleasurable euphoria, enhanced perceptions, and thought disruption. Occasionally there is impairment of recent memory, depersonalization, and paranoia. Despite this, both groups generally judge the experience to be pleasurable.

Psychological dependence and the search for insight or a meaningful affective experience appear to be correlated with multiple drug use. Multiple drug use is also associated with poor work adjustment. Goal-directed activity and the ability to master new problems are diminished. By traditional psychiatric standards, social adjustment in heavy users is poor, as are their relationships with women. There is also evidence of less than satisfactory sexual adjustment in this group. A significantly increased hostility mood score was noted in the heavy drug users following a structured interview.

Data on drug use frequency were available for all 66 subjects who returned questionnaires. Patterns of drug use in this larger group were the same as for the 24 subjects finally selected.

All probability levels are two-tailed.

A similar but not significant trend is evident in the mother-child relationship, both as it existed in the past and currently.

Readministration of the POMS at a later time (in a noninterview situation) no longer revealed any difference in hostility between the two groups. This suggests that our heavy smokers were reacting differently to some aspect of the psychiatric interview.

REFERENCES


