Psychological Reports, 1981, 48, 447-454. © Psychological Reports 1981

VARYING LEVELS OF MARIJUANA USE BY ADOLESCENTS AND THE AMOTIVATIONAL SYNDROME

CHRISTOPHER R. CREASON AND MORTON GOLDMAN¹

University of Missouri-Kansas City

Summary.—The amotivational syndrome hypothesis states that marijuana use decreases the users' activity level and will to achieve. The syndrome is a consistent feature of the clinical studies that dominate the marijuana literature, but the experimental studies have produced equivocal results. The present study used an objective measure of motivation to determine the effect of various levels of marijuana usage on motivation. The subjects were 55 high-school age adolescents who were categorized into four marijuana usage groups: nonusers, casual users, heavy users, and heavy users who were now ex-users. The results showed that the heavy- and ex-users were significantly lower on the measure of motivation than the casual and non-users. The conclusion was that a third factor, such as boredom or peer-group association, produces both an increased likelihood of heavy marijuana use and lowered motivation.

For nearly two decades, marijuana has been the focal point of the nationwide debate on drug abuse. The drug has been studied physiologically, sociologically, behaviorally, biochemically, and anthropologically; the literature is voluminous. Foremost among the fears about marijuana is that marijuana causes the user to lose interest in the world around him and to lose his will to achieve. The effect has been termed the amotivational syndrome, for it implies that the user is less motivated than he was before or would be if not using marijuana.

The amotivational syndrome was first articulated in the late 60's by Smith (1968), who operated the free clinic in the Haight-Asbury district of San Francisco. The amotivational syndrome served as an explanation for the dropout phenomenon of disaffected youth. Research and reports dealing with the amotivational syndrome had more recently come from clinical studies (Kolansky & Moore, 1972; Bloomquist, 1971; Nahas, 1973), correlational studies (Brill & Christie, 1974; Johnston, 1973; Tart, 1971), cross-cultural studies (Benabud, 1959; Miras, 1969; Lambo, 1965; Sovief, 1967; Rubin & Comitas, 1972), and laboratory studies (Carlini & Kramer, 1965; Ferraro & Grilly, 1973; Cappell, Webster, Herring, & Ginsberg, 1976).

The object of the present study was to assess the effects of marijuana on motivation in a different manner than is traditionally used. The first difference is that adolescents were employed rather than adults. Although numerous other studies have examined marijuana and adolescents, these studies have all relied on survey approaches; the controlled experiments involved adults ex-

¹Request reprints from M. Goldman, Psychology, University of Missouri-Kansas City, 5319 Holmes, Kansas City, MO 64110.

clusively. That leads to the second difference in this study: it was an attempt to assess the long-term motivational effects with an objective dependent variable rather than by surveys and self-reports. A problem with surveys and self-reports is that, although subjects may report their drug use accurately, there is a natural tendency for subjects to deny any possible negative side effects and present themselves and marijuana use in a positive light. An objective measure avoids this subjectivity.

This study also attempts to account for the vagueness of the definitions of marijuana use by dividing users into casual and heavy users. The reason for this is that marijuana use ranges from one-time experimental use to practically constant use; to lump this whole range into one category cannot help but distort the results.

The final issue that this study attempts to deal with is causality. It is impossible to determine causality of possible marijuana effects without lengthy longitudinal studies with multiple baselines of use and abstinence. This is far beyond the scope of this study. However, it was possible to obtain an indirect baseline. In this study, the baseline was obtained from a group of adolescent marijuana users who were involuntarily forced to abstain from marijuana for 6 mo. This way we can determine whether this group, the ex-users, are more similar motivationally to non-users, casual, or heavy users. If they are more similar to the non-users, it is strong evidence that abstaining from use returns the user to his "natural" level of motivation, an indication that marijuana is the causal factor in the amotivational syndrome and also an indication that there may be no permanent damage resulting from marijuana use. However, if the ex-users still resemble the heavy users motivationally, it is a strong hint that refraining from marijuana has no motivational effect and that the causal factor for the amotivational syndrome may also have induced the use of marijuana. Or, perhaps damage resulting from marijuana use is not reversible in a 6-mo. period.

The basic framework of the present study was to categorize the subjects according to marijuana use, then make an objective measure of the subjects' motivation and determine if the different categories of subjects vary in motivation. The measure of motivation is the difference between the subject's performance on a task when working for a reward and when the subject is not externally motivated. A subject who performed better working for a reward than when not was considered more motivated than a subject who performed at the same level regardless of whether there was a reward at stake.

Method

Subjects

The subjects were 55 adolescents 15 to 18 yr. of age. Forty-three of the subjects were enrolled in American History and English classes at a Kansas City

١

high school and the remaining 12 subjects were enrolled in a 6-mo. drug rehabilitation program and were completing the last month of the program. As part of the rehabilitation program, these 12 subjects had been forced to submit to urinanalysis to detect the presence of drugs, including marijuana; two positive results would have resulted in the subjects' being sent to jail. These subjects, therefore, had completed five marijuana-free months. Approximately one half of the subjects were boys and the other half girls.

Procedure

The first step in the procedure was to administer a questionnaire which covered various aspects of life; the only relevant item was "How often did you smoke marijuana in the previous month?" The subjects were asked to check one of the following: never, less than once a week, once or twice a week, three or more times a week, daily. The responses were classified into three groups: non-users ("Never"), casual users ("less than once a week" or "once or twice a week"), and heavy users ("three or more times a week" or "daily"). In addition, the 12 subjects in the rehabilitation group were classified into a fourth group, ex-users. There were 19 subjects in the non-user category, 13 subjects in the casual category, 11 subjects in the heavy-user category, and 12 subjects in the ex-user category.

The subjects were presented a list of single-solution anagrams and told that a problem-solving study was being conducted. They were asked to unscramble the list of letters and form common words. The experimenter wanted to see how many they could solve and gave 3 min. to complete the task. On the completion of 3 min., the subjects were presented with a second set of anagrams and told that they would have a second set of letters to unscramble and form into words. The experimenter stated that five dollars would be given to the person who improved the most on this second list as compared to the first list. The reward was for the most improvement, and it did not matter how many were solved the first time or how good they were at solving the scrambled words. What was important was to work as hard as possible this time so that the improvement would be enough to win the five dollars. The subjects were again given 3 min. to complete the task.

Dependent Variable

The dependent variable was the difference in the number of solved singlesolution anagrams between the first and second trials. The assumption was that the first trial measured raw ability to solve anagrams, the second trial measured the ability to solve anagrams when motivated and that the difference between the two would be a measure of motivation.

RESULTS

Mean anagram scores for the first trial, second trial, and difference be-

tween the two trials for the four categories of subjects are presented in Table 1.

The first analysis examined the mean scores for the four categories of subjects on the first trial to see if the initial performance was different. The analysis of variance indicated that the differences among the means on the first trial scores were well within chance occurrences (F < 1.00).

An analysis of variance was carried out comparing the mean difference scores for the four categories of subjects and the results were significant (F =4.80, p < .01).

MEAN ANAGRAM SCORES FOR FOUR CATEGORIES				
	Non-user	Casual-user	Heavy-user	Ex-user
Trial 1	5.68	5.38	4.73	4.33
Trial 2	7.79	7.76	5.44	4.75
Difference	2.11	2.38	.71	.42

TABLE 1

Comparisons of mean difference scores between two categories were next made. Non-statistical significance was obtained when the mean for the nonuser category was compared with the mean for the casual-user category and when the mean for the heavy-user category was compared with the ex-user category (p > .50 for both comparisons). The mean for the non-user category was significantly greater than the mean for the heavy-user and the mean for the ex-user categories; and the mean for the casual-user category was significantly greater than the mean for the heavy-user and ex-user categories (p < .02 for all comparisons). Thus there was a significant gap when the means for the non-user and casual-user categories were compared with the means for the heavy-user and ex-user categories. Drug use appears to be an important factor affecting motivation. Subjects who in the past had frequently used marijuana (the ex-users and heavy-users) were lower on the motivational measure than subjects who either did not use or infrequently used marijuana.

DISCUSSION

The results obtained in this study, that there is a significant difference between the heavy- and ex-users and the non- and casual-users, provide support for the amotivational syndrome hypothesis. However, the results indicate some additional qualifications. The two groups who showed lower motivation were the ex-users and heavy users, and what these groups share is a past history of heavy marijuana use. The fact that the ex-users were indistinguishable from the heavy users indicates that the actual immediate presence of the drug is unimportant; while the similarity of the casual users to the nonusers indicates that moderate use of the drug may be unimportant to motivation. To alter motivation sufficiently, drug use must be heavy, but it need not be enduring (at least a lapse of six months did not produce an alteration).

The question is, what is the mechanism for the motivational differences. There are three possibilities: prolonged, heavy drug use causes some chronic brain syndrome producing low levels of motivation on certain types of tasks, low motivation causes drug use, or a third factor causes both drug use and low motivation. Each possibility, in turn, will be examined.

That marijuana causes some chronic brain syndrome which biologically alters neurological functioning and behavior has not recently been advanced; instead, most hypotheses suggest psychological dependence. There is some evidence, however, that could point to a brain syndrome. For instance, marijuana is known to be slowly metabolized and to remain in the bloodstream for weeks after its intake. Also, marijuana has been linked with hormonal levels, in particular with decreasing testosterone production (Mendelson, Kuehnle, Ellingboe, & Babor, 1975). Therefore, it is possible for chronic use to elevate levels of marijuana in the blood to the point where more THC is taken in than can be metabolized. Since testosterone is certainly a factor in biological drives, particularly sex, elevated THC levels and resulting depressed testosterone level could serve to reduce sexual aggression-related drives. Since much of human behavior (especially for adolescents) is at least peripherally related to these drives, marijuana use could causally affect motivation. However, the above hypothesis is weakened by noting that casual users with some likely THC in their systems, are not intermediate between the heavy users and the non-users; in fact, the casual users are higher, albeit insignificantly, in motivation than the non-users. Furthermore, the five-month abstinence from marijuana should have provided some detoxification for the ex-users, however, the results of the study indicated that they did not have higher motivation than the continual heavy users.

The second alternative is that low motivation causes drug use. This hypothesis best fits into Goode's (1970) subcultural model, that individuals outside the mainstream are more likely to indulge in drug use. One clear piece of evidence to support this theory is presented by Halikas, Goodwin, and Guze (1972), which showed that the deviancy of marijuana users was more related to their social attachments rather than drug use *per se*. An adolescent who is below average in motivation will be more likely to engage in nongoal-oriented activities, of which drug use is a prime example, because he is uninterested in more traditional goal-oriented concerns (such as school, athletics, etc.) and there is nothing else to do.

The third explanation is that there is a third factor responsible for both the low motivation and heavy marijuana use. The studies seeking personality correlates of marijuana use have been unsuccessful in discovering any possible personality factors that could be responsible. However, these studies have lumped together individuals who use the drug at all frequency levels and the evidence of this study and others indicates that casual or experimental users (the bulk of all users) are indistinguishable from non-users in almost all personality factors. Future studies of correlates of heavy use might shed light on any possible personality or behavioral factors which could influence both marijuana use and motivation.

Of course, there is always the factor of peer groups' influences, which have frequently proven to be the most valid predictors of drug use. The third factor may be nothing more than social group norms. Heavy marijuana use may be the prescribed recreation activity of certain adolescent subgroups, which might also frown on competitiveness (certainly that was the case in the 1960's when being "laid back" and drug use were both integral parts of the counterculture ethos).

The most viable explanation for the results appears to be that the heavy and ex-users share a personality factor that distinguishes them from the casual and non-users and that this factor is independent of present marijuana use while it does make the subject more likely to use marijuana.

Several studies tend to support this explanation. Johnston (1973) stated that users were lower in motivation (that is, academic underachievers) before the onset of their drug use. Kupter, Dufre, Koral, and Fajanes (1973) found that heavy drug users were more inclined to be depressive even prior to their first drug experience; Halikas, *et al.* (1972) reported that drug users were apt to come from social circles with a higher probability of deviant behavior. Curtis (1975) observed that the only factor reliable in predicting adolescent marijuana use besides tobacco use (one's willingness to stick burning objects in one's mouth is certainly a factor) is the usage within the subject's circle of friends; and Tec (1972) reported the use of marijuana by adolescents is a function of their social status in school.

When viewed in the perspective of the above studies, one practical explanation of the study's results emerges. Marijuana use among adolescents is spread across all types and categories of young people, but that heavy marijuana use is limited to those who are already inclined to low motivation and depression. The adolescent with wide outside interests would not have time for daily marijuana use, but the adolescent with nothing else to do would. Such a bored young person would tend to gravitate toward others who are similarly uninvolved, and these peer groups would produce reinforcement for continued drug use. In this respect, marijuana smoking may become a group recreational activity in the same manner that sports, academics, or music might function for different groups.

Finally, implicit in the conclusion that the motivational "effects" of mari-

juana are in fact manifestations of other factors is the notion that in tackling the problem of drug abuse we are dealing with symptoms rather than causes. This does not mean that drugs like marijuana do not escalate to some extent the process of apathy or withdrawal or that hard drugs are not a causal factor in personality deterioration. It may mean that motivation of adolescents needs to be confronted directly by encouraging involvement rather than to assume that the elimination of drug use will restore users to normal adjustment.

There is a qualification that must be added to any interpretation of these results. The desire for external reward is but one type of motivation. Rewarded motivation was used in this study, as with most studies involving humans, because rewards are relatively easy to control experimentally while avoiding ethical problems involved in using aversive motivation or punishment on unsuspecting subjects. However, further research will be needed to ascertain whether drug users vary in other types of motivation in the same ways as this study suggests they vary in rewarded motivation. The "need for achievement" would be an obvious area to search for motivational differences along with other motivations for actualization or aversive motivation or punishment. The flaw in the amotivational syndrome may well be that the concepts of motivation and drug use are too nebulous to fit neatly into any single explanation.

REFERENCES

- BENABUD, A. Psychopathological aspects of the cannabis situation. Bulletin of Narcotics, 1959, 9, 2-16.
- BLOOMQUIST, E. Marijuana: the second trip. Beverly Hills: Glencoe, 1971.
- BRILL, N., & CHRISTIE, R. Marijuana use and psychosocial adaptation. Archives of General Psychiatry, 1974, 31, 713-719.
- CAPPELL, H., WEBSTER, C., HERRING, B., & GINSBURG, R. Alcohol and marijuana: a comparison of effects on a temporarily controlled operant. Journal of Pharmacology and Experimental Therapeutics, 1976, 198, 42-44.
- CARLINI, E., & KRAMER, C. Effects of cannabis sativa on maze performance of the rat. Psychopharmacologica, 1965, 7, 175-181.
- CURTIS, D. Social determinants of marijuana usage among high school juniors and seniors. Unpublished Master's thesis, Univer. of Missouri-Kansas City, 1975.
- FERRARO, D., & GRILLY, D. Marijuana extract in chimpanzees: absence of long-term effects on operant behavior. Psychological Reports, 1973, 32, 473-474.
- GOODE, E. The marijuana smokers. New York: Basic Books, 1970.
- HALIKAS, J., GOODWIN, D., & GUZE, S. Marijuana use and psychiatric illness. Archives of General Psychiatry, 1972, 27, 162-165.
- JOHNSTON, L. Drugs and American youth. Ann Arbor: Univer. of Michigan Press, 1973.
- KOLANSKY, H., & MOORE, W. Clinical effects of marijuana on the young. International Journal of Psychiatry, 1972, 10, 55-67.
- KUPTER, T., DUFRE, J., KORAL, P., & FAJANES, P. A comment on the amotivational syndrome in marijuana smokers. *American Journal of Psychiatry*, 1973, 130, 1319-1323.
- LAMBO, T. The use of cannabis in Nigeria. Bulletin of Narcotics, 1965, 17, 3-13.
- MENDELSON, J. H., KUEHNLE, J., ELLINGBOE, J., & BABOR, T. F. Effects of marijuana on plasma testosterone. In J. Tinklenberg (Ed.), Marijuana and health bazards. New York: Academic Press, 1975. Pp. 83-93.

MIRAS, C. Experience with chronic hashish smokers. In J. R. Wittenborn, H. Brill, J. P. Smith, & S. A. Wittenborn (Eds.), Drugs and youth. Springfield, IL: Thomas, 1969. Pp. 191-198.

NAHAS, G. Marijuana: deceptive weed. New York: Raven, 1973.

- RUBIN, V., & COMITAS, S. L. A study of the effects of chronic ganja smoking in Jamaica. NIMH Contract No. 42-70-97, 1972.
- SMITH, D. Acute and chronic toxicity of marijuana. Journal of Psychodelic Drugs, 1968, 2, 37-47.
- SOVIEF, M. Hashish consumption in Egypt with special reference to psychosocial aspects. Bulletin of Narcotics, 1967, 19, 1-12.
- TART, C. On being stoned: a psychological study of marijuana intoxication. Palo Alto: Science & Behavior Books, 1971.
- TEC, N. Some aspects of high school status and differential involvement with marijuana: a study of suburban teenagers. Adolescence, 1972, 7, 4.

Accepted March 13, 1981.