In the compensatory tracking task, the visual delay produced disturbances other than those caused by the reversal of vision. To what extent are common defects of vision the result of disturbed oculomotor, accommodative, and convergence feedback timing, and to what extent are they purely optical defects? Inasmuch as there are many possibilities for delay in learning and positioning the retinal image through different stages of dynamic ocular movements, the production of visual defects by delayed retinal feedback is a possibility. Precise feedback timing may be an imperative of effective seeing that is on a par with optical factors. Real-time computers and electronic-optical methods may become essential to analysis of normal and disturbed vision in the future.

Our findings on delayed eye movement–retinal feedback add to the observations on reversed ocular feedback in challenging the validity of the Helmholtzian doctrine of learned space perception. In this view, time factors are recognized only as a condition of temporal contiguity in visual-tactual learning which serves to create the perception of space. Ocular-retinal timing in dynamic positioning of the retinal image is fundamental to control of visual direction and the accurate perception of such direction. The control and sensing of visual direction are directly determined by the built-in dynamic feedback relations between direction-specific pursuit and saccadic movements and positioning of the retinal image. When these feedback relations are altered by either spatial displacement or delay, control of vision is reduced to unstable saccadic movements. The results thus give a human behavioral meaning to past neurophysiological findings that visual nerve cells of the retina, midbrain, and cortex of animals and men are direction specific (*6*) and that such directional specificity is involved in directional control and specificity of ocular and head movements (*7*).

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## Marijuana Use Among Urban Adults

Abstract. *A relatively high proportion of young adults in San Francisco have used marijuana one or more times. The proportion in this age group who have used marijuana is as great among nonstudents as among students.*

Systematic research on the use of marijuana has been conducted almost exclusively among student populations. The present analysis is an attempt to determine the generality of marijuana use among older persons and among young adults who are not necessarily students. It is also designed to identify other demographic and psychological variables that are associated with the use of marijuana. This research was part of a study designed primarily to examine the acquisition and use of psychotherapeutic drugs, including tranquilizers, stimulants, sedatives, and hypnotics.

The study was conducted among adults in San Francisco during 1967–1968. Personal interviews were held with 1104 men and women, all 18 years of age or older. In order to obtain a representative cross section of San Francisco's population, strict probability sampling was employed. The personal interview that formed the basis of this survey lasted an average of 1.4 hours. The interviewer began by asking some general questions about physical and mental health and about ways in which respondents had handled various problems. The interview then proceeded gradually to more sensitive questions about use of psychotherapeutic drugs. At the end of the interview, respondents were asked if they had ever tried any other mood-changing drugs, including marijuana and LSD. No detailed information was collected on the history, duration, or frequency of respondents' experience with psychedelic drugs. The sole question at issue, then, was whether or not the respondent had "ever used" marijuana or LSD.

Although some respondents may have withheld information, interviewers reported that most respondents appeared very candid about their use of all drugs, including the psychedelics. This judgment is supported by the fact that the proportion of people in our sample who report ever having used marijuana or LSD is much higher than we had expected; in fact, the proportion of our young San Francisco adults claiming some experience with psychedelic drugs is at least as high as the proportion of college students reporting such experience in other studies made at the same time.

Of San Francisco's adults aged 18 and over, 13 percent report having used marijuana one or more times, and 3 percent have taken LSD (*1*). About twice as many men (18 percent) as women (9 percent) have used marijuana, and the same pattern for men and women applies to LSD at much lower percentages.

Young men or women are much more likely to have used these drugs than are older men or women. Practically no one 30 years or older reports ever having used LSD. One-half of the 18- to 24-year-old men and one-third of the women of this age have used marijuana. When the age group is expanded to include those up to 34 years old, more than one-third of the men and about one-fourth of the women report having used marijuana. Among men aged 35 and over, 9 percent have used marijuana; among women in the same age group the figure is only 1 percent.

White women under 35 are twice as likely as Negro women of that age group to have tried marijuana. However, the proportions for white and Negro males of that age group are quite similar. (Slightly more than one-third report having used marijuana at least once.) Beyond age 34, relatively more Negro males than white males (18 and 8 percent, respectively) report having used marijuana at some time. This pattern undoubtedly reflects the growing acceptance by the young white middle class of a drug formerly associated with lower social classes and minority groups.

When we confine our examination to persons of college age (18 to 24 years old), we find that in general the proportion of students who report using marijuana does not differ markedly from the corresponding proportion among nonstudents. But the pattern varies by sex. Thus, in our sample,

coeds appear to have a higher probability of marijuana use than do women who are not college students. But men presently in college are somewhat less likely than other men of the same age to have used marijuana. Another point might be noted: if we consider only nonstudents among the men aged 18 to 34, the high school dropouts and those who completed less than 4 years of college are most likely to have used marijuana.

Despite the fact that these different patterns according to sex are based on small numbers of cases, they may reflect the different implications of attending college for men and women. Men, whose education is essential to their achieving career status, may be more reluctant to jeopardize their college career through the use of illicit drugs. For women, on the other hand, attending college is perhaps more a means of emancipation from the traditional expectations regarding feminine behavior. The use of marijuana by college women may also be a means of affirming equality and freedom.

Within the 18- to 34-year age group, which represents about four-fifths of the users, there are other subgroups in which the likelihood of having used marijuana is relatively high. (i) Women who live in households where yearly income is less than $5,000 (more than one-third of such women report having used marijuana). (ii) Single women who do not live with their parents (about two-fifths of this group report they have used this drug). (iii) Men and women who could be regarded as heavy smokers (51 percent of the men and 42 percent of the women who smoke a pack or more a day report having used marijuana at some time). (iv) Men and women who can be described as heavy drinkers (either in terms of frequency, usual amount, or maximum amount of alcohol consumed). More than one-half of the men and more than one-third of the women in this category report having used marijuana. Marijuana users among student populations have often claimed that smoking marijuana is an alternative to drinking. The present study shows that use of marijuana and alcohol tends to be positively correlated in the general population. (v) Men and women who hold unconventional views regarding the physician's role as distributor of drugs, for example, those who have used prescription-type psychotherapeutic drugs and have obtained them from a nonmedical source, or those who would be willing to take a tranquilizer even if it were not prescribed by a physician. Among those who have obtained prescription-type psychotherapeutic drugs from nonmedical sources, the proportions who have used marijuana are very high: 73 percent of the men and 51 percent of the women. (vi) Men and women whose values in general tend to be nontraditional. Lack of religious affiliation in particular is a good predictor of marijuana use—56 percent of the men and 63 percent of the women in this category report having tried marijuana. Furthermore, among those with low scores on a stoicism-traditionalism index (*2*), at least one-half of the men and women had tried marijuana one or more times, as compared to only one-tenth of those with high scores.

Still within the 18- to 34-year age group, we find the following subgroups in which the likelihood of having used marijuana is relatively low. (i) Married persons with children. Among women in this group only 8 percent report any marijuana use. (ii) Persons born outside the United States. The rate among the foreign-born was only 15 percent for men and 8 percent for women. (iii) Nondrinkers and nonsmokers. The small group of male nondrinkers showed no marijuana use. Among female nondrinkers, the comparable figure was 13 percent. Percentages were slightly higher, but still relatively low for marijuana use among those who have never smoked (17 percent of the men and 8 percent of the women).

Because of the apparent relations among characteristics associated with marijuana use (for example—no religious affiliation, low scores on the scale of stoicism and traditional values, tendency to smoke and drink, and so forth), we decided to perform a multiple regression analysis. For women, no religious affiliation continued to be the most critical characteristic associated with marijuana use. Among men, the apparent contribution of religious affiliation is reduced by the joint effect of several other variables, including smoking, drinking, and rejection of traditional values, which in combination are more highly related than is religious affiliation to marijuana consumption.

The probability of having used marijuana differs quite sharply among the various subgroups studied, and the regression analysis yielded a multiple correlation coefficient of 0.62. Although those who have used marijuana are found quite disproportionately in a number of nontraditional or deviant population subgroups, it is important to point out that the majority of marijuana users appear to be reasonably conventional according to the indicators used in this study. This apparent contradiction may be explained with the example of religious affiliation. Persons with no religious affiliation are more likely than others to have used marijuana, but such persons comprise only one-fifth of the sample of those aged 18 to 34. Consequently, when we consider all marijuana users in this age group we find that the majority (about three-fifths) claim some religious tie. The same point could be made for other variables. Thus, one-half or more of the men and women aged 18 to 34 who have used marijuana smoke less than a pack of cigarettes daily, take less than five drinks per sitting, and so on.

With these strictures in mind, one might reemphasize the primary findings that emerge from this study—a relatively high proportion of young adults (in San Francisco at least) have used marijuana one or more times. The proportion in this age group who have used marijuana is as great among nonstudents as among students. The data generally confirm the view that marijuana use tends to be associated with an "antiestablishment" point of view and to some extent with a search for a new ethic. Nevertheless, the majority of men and women who have used marijuana appear to be reasonably conventional.

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### References and Notes

1. This paper focuses on the use of marijuana rather than that of LSD because of its greater prevalence. Among the entire sample only 33 persons reported having ever used LSD. Because of this small number, findings for LSD are presented only for the population as a whole and for age and sex subgroups, but not for the other variables considered in relation to marijuana use.
2. This index is based on responses (agree-disagree) to such statements as: "There is something wrong with a person who is not willing to work hard," and "We should bear our troubles bravely and not complain."
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