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The Natural History of Drug Abuse

Lee N. Robins, Ph.D.

INTRODUCTION

The first step in discussing the natural history of drug abuse has to be to offer a definition of what we mean by drug abuse. By "drugs" we will mean only illicitly used psychoactive drugs--that is, either those bought through illegal channels or obtained legally but used by persons for whom they were not prescribed or in quantities larger than prescribed or for purposes other than those for which they were prescribed. By "abuse" we mean all such illicit use up to the point of addiction. The reason for selecting this definition of "abuse" is primarily a practical one. Stopping short of addiction conforms to the definitions of substance or drug abuse in ICD-9 and DSM-III, where "abuse" is used to categorize problems with drugs which do not encompass drug dependence.

While our separation of "abuse" from dependency conforms with ICD-9 and DSM-III,' we will not require social or health problems resulting from use, as these sources do when they define abuse. Because we are discussing only the illicit use of drugs, one could justifiably argue that any use constitutes abuse. But a more telling reason for not attempting to distinguish abuse from use is that most of the studies on which we will draw have not made this distinction. Further, since abuse inevitably must be preceded by use, use would play a part in the natural history of abuse as a predisposing factor in any case.

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[1]ICD-9 is the 9th revision of the International Classification of Disease by the World Health Organization; DSM-II I is the American Psychiatric Association's Diagnostic and Statistical Manual.

Having decided that our review will encompass any use of illicit drugs short of addiction, we still need to decide whether drug abuse thus defined has a natural history to describe. Unlike schizophrenia, which is a rare disorder but one which is recognizable in every culture and in every historical period, drug abuse has emerged as a series of "epidemics" of abuse of different drugs affecting different age, sex, and socioeconomic groups at different historical times and in different countries. As the groups affected vary, the natural history may vary, just as the natural history of measles differs in adults and children, and in children who are chronically undernourished as compared with those who are well fed. The particular drug or drugs abused may each have its own natural history of abuse, as well. To take an analogy from the infectious diseases, to attempt to talk about a natural history of drug abuse may be equivalent to trying to describe the natural history of "infection," rather than the natural history of particular infectious diseases. As both agent and host vary over time and place, our description may be accurate only for a particular moment in time and a particular location. Thus while we can describe the natural history of schizophrenia with some confidence as a rare disorder having its onset in young adulthood, and having a chronic course if untreated, there is no such simple description of the natural history of drug abuse.

Recognizing these limitations, we will nonetheless attempt to fashion a natural history by summarizing what is known about the circumstances of initiation, which groups are most vulnerable to drug abuse, motivations for use, how drugs are taken, to what extent dosages tend to increase, and finally, we will attempt to interpret these findings by asking to what extent the natural history of drug abuse suggests that it is a disorder for which those with antisocial personalities are particularly at risk.

In order to present this picture, we will draw on a variety of studies, but many of our illustrations will come often from our own study of Vietnam veterans, because it is the largest study so far of persons who have been involved in more than casual use of illicit drugs.

A BRIEF HISTORICAL NOTE

Few drugs have been illicit from the moment of their discovery or synthesis. Generally drugs have been defined as illegal only as evidence for problems resulting from their use appeared. Many drugs now illegal have enjoyed a period of legal popularity with the upper and middle classes. As their legal status changed, so did their clientele. Those drugs now valued for their ability to create illicit pleasures have previously been used to relieve physical pain, as cough medicines, as cures for diarrhea, as sleeping potions, as health-giving "tonics," as means of improving daily work performance, and even as cures for dependence on other drugs.

After World War I, in the United States the Harrison Act marked a major attempt to make psychoactive drugs illegal. With this effort there came a reduction in their prescription by physicians and a decline in their use by the middle class. Use became concentrated in various "outsider" groups; such as musicians and minority groups. Since World War II, drug use has become much more widespread. It spread first within the segregated black ghettoes of the United States and from there to urban middle-class college students. From them it

spread to their younger siblings, and to working-class youths and rural populations. Over the course of the last 30 years, the tendency has been for larger and larger groups to become involved and for age of initiation to decline.

In many parts of the world where the older patterns of use by middle-class and rural populations were less forcibly suppressed by legal sanctions, this new pattern of use by urban youths has been superimposed on the traditional pattern. In South America, for instance, urban high school and college students are using marijuana just as children in Europe and America do, but at the same time the coca chewing in the Bolivian highlands continues, with little communication between the two drug cultures.

With the spread of illicit drug use to middle-class youths, there has occurred an enormous increase in drug research, most of it focusing only on this newer postwar pattern. As a result, our ability to describe the "natural history of drug abuse" is in general only an ability to describe the present historical phase. While this limitation must make us wonder about the generalizability of our conclusions, we are fortunate in having available a number of large, well-executed studies that provide documentation of the current drug abuse phenomena that is probably more complete than that available for any other topic of current psychiatric interest.

STUDIES OF THE "NEW" DRUG ABUSE

Among the studies that are most important are those by Lloyd Johnston (1973), which followed tenth graders until a year past high school graduation. They were then asked about their drug use in their senior year of high school and their use in the following year. Johnston is currently doing a similar study beginning with five cohorts of high school seniors each being followed for five years (Johnston et al. 1977).

Another extremely important study was done by O'Donnell et al. in 1976. A large sample of men 20 to 30 was selected from military draft registrations, located, and interviewed about their lifetime drug experiences.

There have been many studies of school populations. Among the most interesting are Kellam et al.'s followup of black first-grade students in Chicago to age 17 (in press), in which they look for predictors in first grade of later drug use. Kandel et al. (1978) did a survey in high schools throughout New York State, and followed their respondents five months later. Their particular interest was in the respective roles of parents and peers in introduction to illicit drug use. The Jessors (1977) did a four-year followup study of both high school and college students, in which they were able to watch the emergence of drug use year by year. Smith (1977) has been following fourth to twelfth graders after four years. Mellinger and Mannheimer are studying the development of drug use in college students (cited in Smith 1977).

Our own work has covered two populations, young blacks and Vietnam veterans. The study of young black men in the mid-1960s was the first nonpatient, nonstudent survey of drug abuse (Robins and Murphy 1967). Later we studied a large sample of Vietnam veterans who had

served in Vietnam at the height of the availability of heroin there, and a matched nonveteran control group (Robins et al. 1977).

Our conclusions about the natural history of drug abuse stem mainly from these studies. Thus we will be describing the drug experience of young people in the United States during the 1960s and 1970s.

VULNERABILITY TO DRUG USE

Drug abuse has spread remarkably in the United States, so that current estimates of the number of high school seniors who have used some illicit drug are over 60 percent (Johnston et al. 1977). As the proportion approaches 100 percent, it becomes impossible to identify a nonvulnerable segment. At this time, however, it is still possible to find some descriptors of persons who are more likely to use illicit drugs, and particularly those more likely to use them early, or to use them more frequently than average, or to use a greater variety of drugs than average.

It is clear that the characteristics of the "new" drug users are very different from the characteristics of the former users. The former users tended to be middle-aged or older women who had a high rate of visiting doctors, and who were well integrated into the "establishment." Young users of illicit drugs differ from them in terms of their demographic characteristics, their family settings, and the kinds of people with whom they associate. Since World War II, young drug users have tended to be urban, male, minority-group members, particularly black and Spanish-American. It has been thought that these young people were from the lowest social stratum, perhaps because impressions were based on those persons who sought treatment only after becoming chronically unemployed. Since drug use is especially common among minority groups, users necessarily include persons of lower class backgrounds. However, neither the minority-group nor the majority-group users come from particularly economically disadvantaged families relative to their own groups, perhaps reflecting the high cost of drugs. The parents of drug abusers, if not poor, do have more than their share of broken marriages, and tend to have a history of excess use of alcohol and psychotherapeutic drugs. The friends of users are themselves users, and support the use of drugs, which makes it easy for the nonuser to obtain the drugs and to find encouragement for their use.

One of the most striking findings of these studies is the brief age span in which the onset of illicit drug use typically occurs. The period of risk begins in the teens and ends by the mid-twenties. As the number of drug users in this age group has increased, there has been a ripple effect to other age brackets, with greatest increase in just younger and just older groups, but first use remains unusual before age 13 or after 25.

The personal characteristics of those particularly liable to use drugs have been obtained by comparing using with nonusing adolescents in the same schools. One of the characteristics looked at from time to time is IQ. The IQ of drug users tends to be good to superior, quite different from that reported for the typical delinquent, whose IQ is slightly below normal. Despite their good IQs, prospective drug users tend to be underachievers in school. They report a lack of motivation

to do well at school; they are not particularly interested in going on to college; and they generally don't like school very much. In early studies of drug-abusing students, it was hypothesized that they had serious personal problems that motivated them to seek escape from reality. There seems to be little evidence for this view. In fact, rather than being maladjusted isolates, drug abusers tend to be more sociable than average. This would seem necessary if they are to have access to drugs through friends. On the other hand, there is some evidence from Kandel et al.'s work that they have more depressive symptoms than nonusers (1978). which suggests that at least occasionally drugs may be used to treat such feelings.

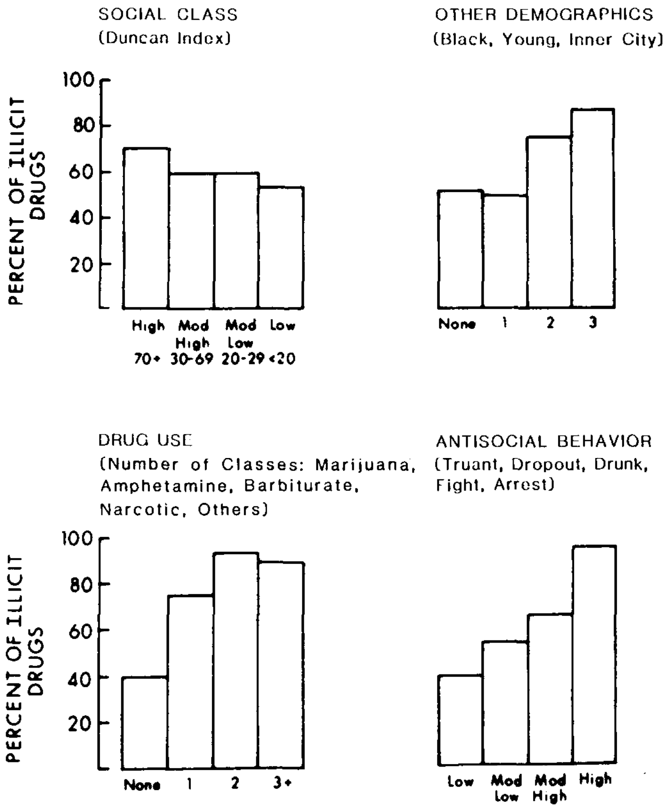
The behavior of drug abusers prior to the onset of drugs resembles that of mild delinquents. They tend to be sexually active at a very young age; they tend to have committed a number of minor socially disapproved acts, such as getting into fights, truancy, getting drunk at a young age, and smoking early. Few have held full-time jobs at the time they take up drug abuse. If they delay drug use until they enter college, those in the humanities or social sciences seem more vulnerable than those in the hard sciences and mathematics. The belief system of those vulnerable to drug use has clearly been nonconformist. They are generally areligious, not greatly attached to home, and generally tolerant of deviance in others. They do not, for instance, voice strong disapproval of shoplifting or truancy.

The characteristics we have described not only tell us which children who have not yet used drugs are particularly liable to become drug users, but they also predict the timing of use--those with these characteristics tend to use at a younger age than those without them--and the frequency of use--those who have these characteristics tend to use more heavily than children without these characteristics even when both use drugs.

Most of the results that we have presented so far come from studies of high school and college populations. These findings apply principally to the use of marijuana, since that is the only drug used with sufficient frequency to be well studied in such general populations. It is interesting, therefore, to compare these results with our results from the Vietnam veteran study, in which we were studying men with easy access in Vietnam not only to marijuana but also to narcotics. We studied a sample of about 1,000 Army enlisted men at ten months after their return from Vietnam, and we then reexamined a selected two-thirds of them when they had been back in the States three years. All had left Vietnam during the month of September 1971. We interviewed 96 percent of our target sample the first time, and 94 percent of that part of the selected sample that we intended to interview the second time. We matched these veterans with a group of nonveterans chosen from draft registrations, in order to see whether the same use patterns held for men who did not serve in Vietnam. At the time we interviewed the veterans for the second time, most were 23 to 24 years of age. In figure 1, we look at preservice predictors of their drug use during the second and third years after their return from Vietnam.

As figure 1 shows, social class was unimportant in predicting drug use in veterans, as it had been in studies of students. On the other hand, other demographic variables, including growing up in an inner city, being black, and entering the service at a very young age were all related to drug use. Early drug use, that is, before the age at which they entered service (i.e., age 18 or younger), also predicted

FIGURE 1.–*Preservice predictors of any illicit drug use by veterans 1973-1974*



From D.E. Smith, S.M. Anderson. M. Buxton, N. Gottlieb, W. Harvey, and T. Chung, eds., A Multicultural View of Drug Abuse--Proceedings of the National Drug Abuse Conference,1977, p.77. (Cambridge. Mass.: Hall/Schenkman, 1978). Copyright © 1978. Reprinted with permission of the publisher.

drug use at ages 23 and 24. The best predictor of all was deviant behavior before service. The deviant behavior scale was made up of five behaviors: truanting, expulsion or dropping out of high school, getting arrested, fighting, and getting drunk before age 15. We combined the predictive variables--demographic, drug use, and deviance--into what we called a "youthful liability scale." This scale did an excellent job of predicting drug use. We also found that it did very well for nonveterans in the same age period.

Our study confirmed the findings of school studies that broken homes and parental alcoholism and drug use predicted veterans' drug use. However, we found that these family variables added nothing to our "youthful liability scale." Apparently coming from this kind of family helped to explain the preservice deviance and early exposure to drugs which in turn predicted drug use in the twenties, but it had no direct effect on drug use at that age.

We found very little else that was predictive of drug abuse in the twenties, although those who had seen a doctor for a nervous or mental difficulty before going into service and who had not worked full time had somewhat increased rates of drug use.

The youthful liability scale predicted use of each of the drugs studied. We studied use of four major types of drugs: marijuana, amphetamines, barbiturates, and heroin. Heroin users had a higher youthful liability score than did users of any other class of drugs. For drugs other than heroin, increased scale scores were associated with a greater frequency of use, but among heroin users, there was no variation by frequency. Use of heroin at any level was associated with a very high score.

There have now been a large number of studies showing that illicit drug use typically starts with marijuana, and that approximately one-half of the marijuana users then try some other drug. If there is only one drug that is going to be used, it is almost always marijuana. This is true in almost every study that we have seen, including the Vietnam veterans. When veterans used a single drug, it was marijuana in nine out of ten cases. Since marijuana is typically the first drug of abuse, it has been called "the stepping stone to drug addiction." This nomination has raised endless discussion as to whether marijuana use "causes" the use of other drugs. Those who say "no" point to the half who use marijuana and never go on to anything else. Those who say "yes" point to the fact that the use of other drugs rarely occurs in the absence of marijuana use. At present marijuana use seems to be a necessary but not a sufficient condition for the progression to other drugs.

The "stepping stone" hypothesis is clearly wrong if it is taken to imply that when marijuana users go on to other drugs, they drop their use of marijuana. In our experience and that of most other studies, it appears that as new drugs are tried, the drug repertoire grows, rather than experiencing the displacement of one drug by another; Use of the less popular drugs, therefore, implies the use of many drugs. Among both our veterans and our nonveterans, there is a strong negative correlation between the frequency with which a particular drug is used and the number of other drugs used during the same time period.

Those marijuana users who go on to other drugs are almost exclusively those who have used marijuana frequently and who began its use early. Most Vietnam veterans who used marijuana several times a week used other drugs as well. Most of those who used marijuana more rarely used nothing else. There is also the fact that the earlier marijuana is used, the more likely it is that there will be other drugs used as well. Marijuana use beginning at age 20 or later in our sample of young black men (Robins and Murphy 1967) was typically infrequent, mild, and involved use of no other drugs at all.

Heroin is a drug that is used infrequently, and thus heroin users typically use many other drugs as well. This phenomenon may have contributed to heroin's reputation as an especially dangerous drug. To find out whether heroin's bad name is largely explained by its place late in the sequence of adding new drugs, we compared on a number of adult variables the outcomes of veterans who used heroin with the outcomes of other veterans, holding constant the number of other drugs used at all, specific other drugs used regularly, and their youthful liability scale scores, since this scale predicted general adjustment as well as drug use. When we controlled on these factors, we found that heroin use was associated with an increase in adjustment problems such as crime, alcoholism, violence, unemployment, and marital breakup, but the increase in such problems accounted for by heroin was no greater than the increase accounted for by the use of amphetamines or barbiturates, similarly studied. Thus the especially bad reputation of heroin seems due more to the kinds of people who use it and the large number of other drugs they use along with it than to properties of the drug itself.

INTERPRETING THE RESULTS

So far, I have tried to describe what we know about the natural history of drug abuse up to the point of addiction, with due recognition that this description is very much a product of one historical era, and that there is variation by location, population, and availability of the drugs even within this era. There are important subpopulations of abusers, such as those overusing prescribed drugs and drug-abusing doctors and nurses that I have not included here at all, in part because they have not been as fully studied.

To summarize these findings, we find that drug use occurs disproportionately in young people with average or better than average IQs, who come from minority groups, are urban, who have disaffection for school, and who are critical of the conventional social mores of their times; that the earlier drug use begins, the more serious it is; that use typically progresses along quite easily describable lines, beginning with marijuana use, which in itself is predicted by the use of alcohol and cigarettes; and that those who become frequent and heavy marijuana users have a greatly increased liability of progression to other drugs, although they do not give up the use of marijuana as they add new drugs. We have also found that many of the reported characteristics of heroin do not really seem to be distinctive. Heroin of the quality recently available on the street does not seem to differ from other drugs in its liability to frequent use or daily use, although regular users of it do more often perceive themselves as dependent than do users of other drugs, even though they seem able to give it up as readily. To what extent their opinion reflects heroin's bad

reputation rather than their personal experience of craving is hard to say.

Having described the natural history of drug abuse in the United States in the 1970s. there remains the difficult issue of trying to understand the implications of these findings. Is drug abuse simply one part of the general pattern of deviant behavior that we call "conduct disorder" when it occurs in children and "antisocial personality" when it occurs in adults? Or is it simply one expression of adolescent rebellion and deviance among many others? If so, then what we describe as the "natural history of drug abuse" may have little to do with effects of exposure to drugs but may instead be a description of the course of development of juvenile deviance or adolescent rebellion. The progression to the use of a variety of drugs and then the consequent withdrawal from drug use may parallel the general pattern of development of adolescent deviance, followed by a decline in deviance with maturation. To throw some light on that question, we first need to say what the characteristic pattern of development of adolescent deviance is and how closely drug abuse follows the same pattern.

In an earlier study (Robins 1966) exploring the development of the antisocial personality, we discovered that it is primarily a male phenomenon, that it usually begins in the early school years with school failure and truancy, progresses by adolescence into drinking excessively, dropping out of school, and delinquency. Our study and other studies of delinquents find their typical IQ score to be slightly below normal, usually in the low 90s. There seems to be some association with minority group membership. Parents of deviant children often have a history of antisocial behavior themselves, particularly of excessive drinking and crime. Childhood deviance encompasses a variety of juvenile problem behaviors which are all highly intercorrelated, and each is independently correlated with each of the adult behaviors that are part of antisocial personality (Robins 1978). No single childhood behavior appears necessary to the development of antisocial personality, and the <u>variety</u> of childhood deviant behaviors is a better predictor than is the occurrence of any specific type of behavior. The typical adult antisocial pattern includes chronic unemployment, marital breakup, multiple arrests, excessive drinking, and irresponsibility toward sexual partners and children. Like the childhood behaviors, these adult outcomes are highly intercorrelated. Often they terminate in middle age.

Can we see drug abuse as part of this general process? Clearly there are both differences and similarities. Occasional or mild drug use seems clearly <u>not</u> to be part of the antisocial personality. It encompasses too large a proportion of youth, and has few adverse consequences. While more serious abuse of drugs resembles general adolescent deviance in its concentration in urban male minority groups from broken homes and its association with adolescent delinquency, school dropout, and early drinking, it does not occur disproportionately in persons from impoverished families or in children with lower than average IQs, or in those with early school failure and truancy. Its sex distribution is not so one-sided as is the distribution of delinquency or adult antisocial personality.

In adolescence and adult life, the correlates of serious drug abuse are very similar to those of antisocial personality. Those who use drugs heavily have higher than expected rates of adult arrest, unemployment, marital breakup, alcohol problems, and child neglect. Drug abusers

often seem to improve with aging, as do those with antisocial personality, although their recovery may well be earlier--probably between 25 and 30 rather than in the fourth decade. Further, those young people who have the predictors and course typical of antisocial personality are indeed likely to abuse illicit drugs, just as they tend to smoke and drink more than average.

Thus the present picture is a confusing one. Certainly there is some overlap between antisocial personality and serious drug abuse, but there are also striking differences. The most reasonable position at the present time seems to be that drug abuse can be part of antisocial personality, but that most drug abusers probably do not have that syndrome, since the typical drug abuser is so different in terms of IQ, social class, history of elementary school problems, and very early termination.

The fact that the preuse history of drug abusers is more favorable than that of persons with antisocial personality, and yet the adult outcomes are often equally disastrous, leaves us with the possibility that it is exposure to drugs itself that may be harmful, in addition to any underlying effects of the predisposition of the drug user. While this is an important concern, the good recovery of Vietnam veterans shows that any harm that the drugs may engender need not be permanent or irreversible, if the supply of drugs again contracts. I am afraid that the implications of these findings are that we must continue to rely on supply control as a chief preventive measure, until we can provide some other explanation for the adverse outcomes of those who become frequent users of illicit drugs.