The natural history of drug abuse

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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. In addition, the separation of abuse from addiction allows a distinction between our own contribution and that of other contributors to this symposium who have been charged with describing the “careers” of addicts, a term which might be considered a synonym for the natural history of addiction.

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.

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 personality 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 ghettos 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 youth and rural populations. Over the course of the last 30 years, the tendency has been for larger and larger groups to become involved and 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 youth 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 drugs use to middle-class youth, there has occurred an enormous increase in drug research, most of it focusing only on this newer post-war 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 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's follow-up of black first-grade students in Chicago to age 17 (1978), in which he looks for predictors in first grade of later drug use. Kandel (1978) did a survey in high schools throughout New York State, and followed her respondents five months later. Her particular interest was in the respective roles of parents and peers in introduction to illicit drug use. The Jessors (1977) did a four-year follow-up 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 4th to 12th 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-1960's was the first non-patient, non-student survey of drug abuse (Robins & 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 1960's and 1970's.

Entry into drug use

One of the consistent findings in all of these studies has been that the introduction to drugs has been almost exclusively through friends. Studies agree that almost all users had friends who were using before their own use began. The typical first drug used was a gift from a peer, not a purchase or a prescription. This picture is in marked contrast to the older pattern, in which the physician was often the source of the initial drug exposure. It also differs from the early Government antidrug propaganda, which invented the evil drug “pusher” in the schoolyard giving away free samples to create a market for his devilish products. There has been no need for “pushers” in recent years. At least in the United States, the illicit drug market has definitely been a seller’s market.

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% (Johnston (1977)). As the proportion approaches 100%, it becomes impossible to identify a non-vulnerable 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-Americans. 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 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 non-user to obtain the drugs and to find encouragement of 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 at 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 non-using 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. This result was confirmed by Kellam, who found that the first graders who were likely to use drugs by the time they were 17 had tended to be superior on reading scales, by our study of young black urban men (Robins (1967)) and by our study of Vietnam veterans. Despite their good IQ's, 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's work that they have more depressive symptoms than non-users (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 and 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 had 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 non-conformist. 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 younger 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 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% of our target sample the first time, and 94% of that part of the 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 23-24 years of age. In Figure 1, we look at pre-service predictors of their drug use during the second and third years after their return from Vietnam.

As Fig. 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 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 (Fig. 2).

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 pre-service 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.

Motivations for use
The findings reported so far concern objective predictors of the drug use. What do users say about their reasons for use? To answer that question, we draw on
O'Donnell's study of young men 20 to 30 years of age. He found some variation in motivation from drug to drug. But for all drugs, and alcohol, the most frequent reason for use was “to get high,” that is, to have a pleasurable experience. The other major reasons offered were to sleep or relax, a motivation that was satisfied by marijuana, narcotics, and sedatives, or to get through the work day, a goal satisfied primarily by stimulants. Men who wanted to heighten their mental experience used marijuana, psychedelics, and cocaine for that purpose. Drugs used to avoid boredom were alcohol, marijuana, and heroin. Drugs used to help one forget one's trouble were the sedatives and heroin. The only drug often used because of social pressure was alcohol.

Methods of administration
How are drugs taken? Again we will rely primarily on O'Donnell for information about the ways that different drugs are commonly used. Users of marijuana all have smoked it, but almost half have also eaten it. In the United States, it is frequently mixed into the batter of “brownies,” a chocolate cookie, and then baked and eaten. Opiates other than heroin are usually taken orally in pills or elixirs, as codeine is, or smoked, as opium is. In the United States, heroin is thought of as a drug that is always injected, but in fact, there are other rather common modes of administration. While users in O'Donnell's sample had injected in 78% of cases, many had also “sniffed” it, inhaling a pinch. In Vietnam, heroin was most often mixed with tobacco and smoked. This was possible because the heroin there was so pure (95%) that there was no need to take it in a concentrated form. But even in Vietnam, regular users did eventually progress to injection, not so much to save money, the presumed motive in the States, but in order to maximize the psychological effect. Among soldiers who used heroin regularly in Vietnam for at least six months, 40% eventually injected. Barbiturates are
taken almost exclusively orally, usually in pill form. Stimulants are similarly taken as pills, although about one-quarter of users reported sniffing them. Cocaine is universally sniffed, but one-third of users have also injected it on occasion.

**Progression to frequent use**

Typical patterns of changes in dosage of illicit drugs over time have been difficult to study because the strength of street drugs varies so greatly over time and from one location to another that changes in frequency of administration cannot be readily interpreted as changes in dosage. In addition, fluctuating availability and cost greatly influence use patterns. It does appear, however, that frequency of use tends to increase over time, suggesting the development of tolerance to most illicit drugs. How much tolerance develops can be studied only in experimental settings where amount of access to drugs of standard quality is known. Such experiments have been carried out in prisons where prisoners were allowed free access to marijuana cigarettes of standard quality. They were found to use up to 17 or 18 a day. Thus there may be a maximum amount of cannabis that can be metabolized in a day, just as there is for alcohol.

It is known that illicit drugs vary greatly in their addictive potential. It was inferred from laboratory experiments showing the high addiction liability of heroin that first use of heroin would progress rapidly to regular use and then to daily use. This assumption seemed to be confirmed by observing the high rate of relapse to addiction of treated addicts, about two-thirds of whom generally appear to be readdicted within six months after treatment (*Stephens & Cottrell* (1972)). Recent research, however, shows that heroin as used in the streets of the United States does not differ from other drugs in its liability to being used regularly or on a daily basis. *O’Donnell* compared the frequency of progression to regular use among men who had ever used a particular drug. He defined regular use as at least twice a month. Progression to regular use was most common for alcohol. All but 9% of drinkers drank at least as frequently as twice a month. Stimulants and heroin had similar rates—about half of the users ever became regular users. Marijuana showed the least progression to regular use, with only one-third of users doing so. Among users, likelihood of daily use was similar for heroin and for alcohol; that is, about one-third of those who ever used either drug began to use it on a daily basis. Marijuana was next most commonly used on a daily basis, with one-quarter progressing to that level, while only one in ten stimulant users ever became daily users.

Our study of Vietnam veterans found this same pattern for heroin use in the United States. While most narcotic users in Vietnam had progressed to regular use, and half became addicted, in the States heroin was not distinctive from other drugs in the likelihood that men would progress to regular or daily use of it, as shown in Fig. 3. It may well be that the high addiction liability of heroin found in laboratory experiments and in Vietnam does not apply to the very adulterated product typically purchased in the streets.

What was distinctive about heroin among the returned veterans was that daily users were much more likely to perceive themselves as dependent on the drug than were daily users of other drugs (Fig. 4). This again agrees with O’Donnell’s findings. Twenty-nine percent of his heroin users said that they had been addicted, while less than 10% of users of other drugs said so.
Fig. 3. Progression to regular and daily use by users of four drugs in the last two years.

Fig. 4. Veterans' psychological dependence on four drugs.
Persistence of use

Another common belief that turned out to be largely a myth was that once heroin use was begun, it tended to continue indefinitely. O’Donnell found that of all men aged 20 to 30 who had ever used heroin, only 31% had taken any of the drug within the last year. Their rate of continuation with heroin was lower than the continuation rate for any other drug. Those who had ever used stimulants, sedatives, or cocaine had used some of that drug in the last year in about one-half of cases. Those who had ever used marijuana had used some in the last year in two-thirds of cases. Those who had used tobacco or alcohol had almost all used some within the last year. Thus there seems to be much more movement out of heroin use than there is out of use of other drugs. There is remarkably little movement out of the use of tobacco, despite health warnings by the Government.

Again, the same findings applied to the Vietnam veterans. Nearly half of them used narcotics at least once while in Vietnam, and more than one-fourth had used them at least weekly there for a month or more. Nonetheless, at the time we studied them when they had been back in the States three years, they were hardly more likely to be using narcotics than were nonveterans. Thus we found no special likelihood for the use of heroin to persist even among those who had used it regularly. In their second and third postwar years, veterans were no more often readdicted than nonveterans (only 2% of either group were addicted at any time during this period). The readdiction rate of Vietnam addicts was only 12% within the three post-Vietnam years. Our results and those of O’Donnell show that, given the heroin market of the 1970’s in the United States, it is possible to use heroin occasionally without becoming addicted. It is still not known how long such occasional use can persist. The time over which addicts have used heroin prior to becoming addicted varies enormously, according to Waldorf (1973). The addicts he studied reported use anywhere from three weeks to six years prior to their first experience of addiction.

Variety of drugs used

The next topic that I would like to discuss is the use of multiple drugs, or as it has been recently called, polydrug use.

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 drugs. 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 9 out of 10 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
Fig. 5. The level of marijuana use and poly-drug involvement.

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 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 (Fig. 5). Most of those who used marijuana more rarely used nothing else. It 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 20 or later in our sample of young black men (Robins & 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 the outcomes of veterans who used heroin on a number of adult variables with the outcomes of other veterans, holding constant the number of other drugs used at all, 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.
Termination
Cross-sectional studies of young people generally find more drug use among the single, and those without full-time jobs. Drug use is also rare among those over 30. Together these facts suggest that drug use probably tends to diminish with aging and as young people take up traditional roles of marriage and work. As yet, there are too few longitudinal studies following drug users through the termination phase to be certain that these are the correct inferences to draw. It is possible that young people who enter adult roles early are just those who never used drugs.

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 IQ’s, 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 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 on it 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 1970’s, 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 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 90's. 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 variety 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 not to be part of 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 IQ's, 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 pre-use 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 explanations for the adverse outcomes of those who become frequent users of illicit drugs.

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