The "Gateway" theory: Does cannabis use lead to hard drugs?

Drug use progression and the gateway effect

Introduction

Modern day research and empirical evidence has largely discredited most myths regarding the claimed horrific consequences of cannabis usage. These days, few people accept that using cannabis leads to terrible episodes of violence, madness, sexual promiscuity and other horrendous happenings. Even with the current prohibitive policies and lack of education no-one will accept ludicrous claims such as that of the American 'Official Expert on Marihuana', Dr James Munch, practicing between 1938 to 1962, who testified in a court of law that marijuana had turned him into a bat [WHITEBREAD95, BONNIE].

However, there is one claim, introduced in the early 1950s, which still pervades debates on drug policy to this day - that using cannabis leads the user into a destructive spiral resulting in the use of more dangerous drugs to their detriment. This is known by several names; the 'stepping-stone theory', the 'gateway effect' and the 'escalation hypothesis' amongst others. Simplistically, the very act of using cannabis in some way predisposes an individual to progress on to becoming a user (often phrased as an 'addict' to emphasise the harm to the individual and society) of hard drugs, such as the opiates (including heroin), cocaine (including crack), amphetamines, lysergic acid diethylamide (LSD) and other such illegal substances generally accepted as more potentially harmful than cannabis itself.

It is interesting to note that the claims as to exactly which so-called harmful drug cannabis usage supposedly leads on to changes over time, in respect to what the popularly-held view is on which drug poses the greatest hazard to humanity. In the 1960s, cannabis use apparently led inevitably to the use of LSD [BLUM70, SHICK68, MCGLOTHLIN68], whereas more recently, as cocaine gained a reputation of being more harmful than LSD, the claims have largely altered such that cannabis use now puts a person on the slippery slope to cocaine addiction [CLAYTON85, CHALSMA94, YAMAGUCHI84A] (references taken from [ZIMMER97, IVERSEN00]).

The claims

Although often the distinction is not made, resulting in some confusion of terminology, there are two dominant methodologies purported to provide the mechanism of action that leads a casual cannabis user on to life as a hard-drug addict. These provide a distinction between the stepping-stone and gateway theory [JOY99].

The first is the prominent argument of prohibitionists, commonly referred to as the stepping-stone theory. It claims that there is some intrinsic chemical or biological property of cannabis that induces (or at least increases the probability of) the user to move on to harder drugs, which have a greater chance of misuse to the detriment of the user [KANDEL92]. It is a pharmacological action inherent in the effects of cannabis that lead a user to experiment with harder drugs.

The second is often called the gateway theory. Confusingly, this is not always distinguished from the stepping-stone theory, and also has been used in a paradoxical fashion to support prohibition of

cannabis. This theory is a social, rather than biochemical, hypothesis. The claim is essentially that as users gain access to and use cannabis, they enter the world of criminality and are immersed in the 'drug culture'. They go to criminals to purchase their cannabis, and whilst there they may be offered other, more potentially hazardous, substances. Many drug dealers sell and use both cannabis and other drugs. The US Department of Health and Human Services released a piece of informational literature, which summed this up by saying

'Using marijuana puts children and teens in contact with people who are users and sellers of other drugs, so there is more of a chance for a marijuana user to be exposed and urged to try more drugs.' [HHS95A]

It should be noted in what follows that in order to enhance clarity of writing, the term 'gateway theory' is used as the general concept of hard drug use progressing from cannabis use, rather than its occasionally used definite differential from the 'stepping-stone theory' outlined above. A note will be made where this distinction is important.

How the gateway theory developed

It is intriguing to note that one of the first incarnations of the gateway theory was exactly the opposite of that claimed today. In the 1920s, some American states criminalised cannabis usage because the law-makers believed that heroin addiction would lead people into cannabis usage [SCHAFFER, WHITEBREAD95, BONNIE]!

In 1937, the head of the Federal Bureau of Narcotics in America was Harry Anslinger. He was adamantly against the reduction of penalties against cannabis use, at that time for the reason that it 'caused insanity, criminality, and death' [SCHAFFER]. He made various unlikely claims that are now often fall into the category 'reefer madness' - ludicrous claims made to exaggerate the 'horrors' of cannabis usage [WHITEBREAD95, BONNIE, TRANSCRIPTS37]. At this time Anslinger firmly stated that there was no connection at all between marijuana and heroin [SCHAFFER, BONNIE].

Between the years of 1948 and 1951 there was a relatively large increase in the use of illegal drugs, especially amongst young people. This greatly concerned Representative Boggs. As a result of this, he put forward a bill (the 'Boggs Act') which aimed to increase and make mandatory certain prison sentences of those who are repeat drug offenders or are involved in supply. As is standard procedure, Congress investigated and debated on the validity of the Act, inviting 'experts' to testify as to their experiences, opinions and evidence regarding this issue. Unsurprisingly, Anslinger was one of those testifying. Perhaps unfortunately for Anslinger, so was Dr Harris Isbell, who was at that time the Director of Research at the Public Health Service hospital in Lexington, Kentucky. Isbell submitted a paper to the Congressional hearing [BOGGS51A]. In it, he stated that cannabis was not addictive, does not induce violent or sexual crimes, does not create a dependence and in essence does not do any of the harmful things that Anslinger et al. previously claimed it did. Other people with a wide range of expertise supported these statements. In short, as [SCHAFFER] puts it, 'all the reasons that had been given for outlawing marijuana in 1937 were entirely bogus.' Upon testifying, Anslinger was thus forced to alter his traditional arguments for increasing penalties for cannabis use so that they did not directly contradict the evidence found in Isbell's submission.

Despite his clear 1937 statement that there was no connection at all between marijuana and heroin, he testified that the danger of cannabis was that:

'Over 50 percent of those young addicts started on marijuana smoking. They started there and graduated to heroin; they took the needle when the thrill of marijuana was gone.'[BOGGS51B]

He gave no evidence for this connection, and no explanation as to why his current testimony was a direct contradiction of his previous statement. This unexplained, unproven, contradictory and emotively-worded testimony was perhaps where the modern-day gateway theory was born, or at least brought into the public eye.

Since then, the theory has survived to the present day. It has long been used as a reason (perhaps even the reason) for the highly-punitive prohibition of cannabis. Governments around the world have used it as a defence for their drug policy, and attempts have been made to do studies and statistical manipulations to show that the gateway theory is correct, that cannabis use leads a person on to heroin (or other harder substance) abuse. Little, if any, hard evidence supporting this view has been found.

Perhaps the most cited modern-day study that is claimed to prove the gateway effect is a report produced by the (US) Center on Addiction and Substance Abuse (CASA) [CASA94] which used, as its basis, the statistics from a National Institute on Drug Abuse (NIDA) survey [NIDA91]. The report resulted in the claim that young users of cannabis are 85 times more likely than non-users to try cocaine. This figure is big enough to attract attention, create headlines, and cause great fear of the progression from cannabis to harder drugs. Indeed it was this figure that formed the basis of an entire anti-drug campaign from the Partnership for a Drug-Free America. What is vital to understand, however, is how the figure was calculated, as this renders it almost meaningless.

The NIDA survey includes questions on which drugs the surveyed person has used. From this, the CASA report determined that from the population of cannabis users 17% had used cocaine whereas from the population of non-cannabis users only 0.2% had used cocaine. The statisticians thus divided the percentage of cannabis users who had used cocaine by the percentage of non-cannabis users who had used cocaine resulting in the figure of 85 [CASA94]. This figure does not show causation - rather than showing that many cannabis users go on to use cocaine, it shows that most cocaine users have used cannabis. One could create almost endless similar statistical analysis's to show any number of different gateway effects. As a document from the Drug Education Project puts it, 'What is not mentioned is that just as many or even more [hard drug users] had probably also drank alcohol, smoked cigarettes, had sex or eaten sandwiches prior to their hard drug use' [DEP]. Instead, it is obvious from these statistics that the vast majority of cannabis users (83%) do not go on to use cocaine. The study actually shows the opposite of what it is often purported to prove; in effect, for most users, cannabis is 'clearly a "terminus" rather than a "gateway" drug' [MORGAN95A].

Do cannabis users go on to use hard drugs?

Studies showing that the vast majority of cannabis users curtail their drug usage after using cannabis rather than being prompted by a gateway effect to experiment with harder drugs abound.

Zimmer and Morgan [ZIMMER97] took data relating to a US national survey carried out by the Department of Health and Human Services [HHS95B, HHS96A] and worked out the percentages of cannabis users who also use cocaine. They found that it was only a small minority (28%) of cannabis users that did go on to try cocaine. Even this minority figure is not indicative of users who gain a cocaine habit. The statistics showed that only about 3.5% of these people that had used cocaine were in the position of using cocaine at the time of the survey, and on a regular basis. Thus it was surmised that 'for every one hundred people who have used marijuana, only one is a current regular user of cocaine'. This figure certainly does not imply a gateway effect.

Likewise, data given by the US Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration showed that in 1990, 40.7% of high school students had tried cannabis at least once. Only 9.4% has ever tried cocaine, and 1.3% had ever tried heroin (reported in [DEP]). Thus, in the worst case scenario, only 23% of cannabis users went on to try cocaine, and just 3% went on to try heroin.

The Common Sense for Drug Policy organisation release a regularly updated report compiling information on several aspects of drug use and legislation. In 1999 they looked at statistics from a report from a US national survey [SAMHA98] and found that whilst over 71 million American had used cannabis, 'for every 104 marijuana users, there is only one active, regular user of cocaine' [CSDP99]. The definition of an 'active, regular user of cocaine' is taken as someone who has used cocaine more than 50 days in the year preceding the survey. This minimal amount of cannabis users moving on to harder drugs, in this case cocaine, shows no sign of increasing. In the 2001 update to the CSDP report [CSDP01], using data from a updated survey [HHS99] researchers found that now over 72 millions American had used cannabis and 'for every 120 people who have ever tried marijuana, there is only one active, regular user of cocaine'.

The National Organization for Reform of Marijuana Laws, researching the prevalence of drug use, found that nearly 66 million Americans who were 12 years of age or older had tried cannabis during their lifetime according to federal statistics (as reported in [MORGAN95B]). They then examined preliminary statistics from the 1995 Household Survey on Drug Abuse [HH96B] and found that fewer than 7 million Americans had ever tried methamphetamines, and only 2.5 million had ever tried heroin. This led them to the conclusions that even US Federal statistics 'conclude that the overwhelming majority of American marijuana users do not move on to harder drugs' [NORML96].

Is there a correlation between prevalence of cannabis usage and hard drug usage?

If the gateway effect of cannabis use is a real phenomenon then it is logical that an increase in cannabis usage would lead to an increase in the usage of the endpoint harder drugs. Simplistically, one would imagine that, assuming the gateway theory were correct, if the amount of people using cannabis doubles then so would the amount of people using cocaine, at least approximately. This obvious relationship however fails to exist in the real world, casting more doubt on the validity of the gateway hypothesis. According to Zimmer and Morgan:

'While marijuana use was increasing in the 1960s and 1970s, heroin use was declining. During the past twenty years, as marijuana use rates fluctuated, rates for LSD remained constant. Cocaine became popular in the early 1980s as marijuana use was declining; later both marijuana and cocaine

use declined. Recently, marijuana use has increased while the decline in cocaine use has continued' [ZIMMER97].

Taking statistics from NIDA [NIDA] they go on to show the 'changing relationship' between the prevalence of usage of cocaine, a classic 'hard drug', and cannabis. With the genuine existence of a gateway effect one would predict that the proportion of cannabis users who go on to try cocaine would remain fairly steady. This is far from the case. In reality, the variance is highly significant. At the extremes, in 1986 thirty-three percent of high school seniors who had used cannabis had also tried cocaine. Nine years later, just 14% of those who had tried cannabis, less than half the 1986 level, had also tried cocaine.

Other sources agree. The large increase in the population of cocaine consumers in the 1980s was seemingly independent of cannabis usage, providing an excellent example of the lack of the correlation one would expect - 'Cocaine abuse exploded at the same time marijuana use declined' [GIERINGER94]. Morgan and Zimmer [MORGAN95A] researched into the change in relative numbers of cannabis users and cocaine users over a longer period of time. Data from NIDA was used, which restricted the period of research to the years since the 1970s, as NIDA did not have the relevant data prior to this time point. Cannabis became more popular throughout the 1970s, and peaked in 1979. During the 1980s, as has been noted previously, the statistics showed a notable increase in cocaine usage, whilst cannabis usage somewhat declined. The early nineties saw a reasonably stable rate of cocaine usage, despite an increase in the population of cannabis users.

In 2001, Golub and Johnson, on behalf of the U.S. Department of Justice, released the report of a study assessing the prevalence of drugs amongst the population of arrestees between the ages of 18 and 20 [GOLUB01]. Despite a reasonably steady usage of cannabis nationally, usage 'soared' within the examined population. However, in the 23 cities looked into, it was found that despite a large increase in cannabis usage amongst the surveyed population there was a significant reduction in the use of both crack cocaine and heroin. This lead Golub to conclude that '…[marijuana] is not serving as a gateway to something else' (as reported in [HERALD01]).

More valuable data regarding the lack of correlation between cannabis usage and hard drug usage can be found in the years after the Dutch government partially decriminalised personal cannabis use and allowed its selling in 'coffee shops'. This situation is more complex however, and probably involves other factors. As such it will be discussed later.

Is cannabis the first drug that hard-drug users experiment with?

The theory that cannabis usage is the first step that leads on to harder drug usage makes the obvious assumption that cannabis is indeed the first drug that hard-drug users sample. If this were not to be the case, then even if evidence existed giving the gateway theory some credence, one could not conclude that it was cannabis that provided the initial step into a career as a hard-drug user. Unfortunately for supporters of the gateway theory, many studies have shown that cannabis is not the first drug of choice that most hard-drug users experiment with - it is simply the first illegal drug.

Iversen, whilst reviewing claims of the cannabis gateway theory, found that 'Many surveys have shown that young people who use psychoactive drugs begin with alcohol and tobacco…'

[IVERSEN00]. Most users start off by using alcohol or tobacco, before moving on to cannabis or hard drugs. Simply because a drug is illegal, there is no reason to suspect that it, rather than any legal alternatives, is the starting point of a user's progression to hard drugs. Studies show that 'In this country [the US], almost everyone who uses any other illicit drug has smoked marihuana first, just as almost everyone who smokes marihuana has drunk alcohol first' [GRINSPOON97]. Even ardent believers in the gateway theory must find it hard to prove that cannabis is the starting point of drug use given the statistics.

In 1996, Kandel and Davies surveyed 7611 students from the ages of 13 to 18, taken from 53 schools in New York [KANDEL96]. Among the students, several used alcohol, tobacco, cannabis and cocaine. On average, alcohol and cigarette use began at the age of 12 - 13. Cannabis usage did not start until the age of 15, and those that used cocaine tended to start at age 15 - 16. Here, if one wishes to point to a psychoactive substance that preceded the usage of any others, cannabis is certainly not such a drug.

Another study by Kandel et al [KANDEL85] looked at adults who had used cannabis during their time at high school, and also had some lifetime experience with cocaine. It was found that the vast majority (over 80%) were polydrug users (i.e. had used more than one drug) before using cocaine. Most had regularly used alcohol and tobacco, as well as cannabis, and several had used an array of other drugs including stimulants, sedatives and psychedelics.

A national survey of drug usage in the US done in 1999 [HHS00] also confirms the fact that most drug users do not begin their drug usage with cannabis. The data provides an estimate of the age's individuals began using certain drugs. It was found that in 1997, the average age that users first experimented with cannabis was 17.2 years. Alcohol usage however first began at the age of 16.1, and cigarettes were typically used at an even earlier age, 15.4 years old on average.

When discussing the issue of cannabis being a gateway drug, the Institute of Medicine's 1999 report [JOY99] states that 'In fact, most drug users do not begin their drug use with marijuana; they begin with alcohol and nicotine'. They also note that this is often not licit drug use, going on to say '…usually when they are too young to do so legally.'

There are a large number of further studies supporting the fact that most hard drug users do not start their drug-taking with cannabis. The National Academy of Science reports that 'Legal drugs for adults, such as alcohol and tobacco, … precede the use of all illicit drugs' (quote taken from an informational leaflet produced by the Family Council on Drug Awareness [FCDA]). The following as-yet-unmentioned references, taken mostly from [ZIMMER97], also hold evidence showing that the vast majority of hard drug users start their experimentation with other drugs before or at the same time as they sample cannabis: [LABOUVIE97], [JOHNSON88], [MULLINS75], [YAMAGUCHI84B], [DONOVAN83], [ELLICKSON92], [KANDEL93], [INCIARDI91], [GOLUB94] and [KANDEL75].

Is there any evidence for the gateway effect in other cultures?

The majority of studies referenced here concentrate on cannabis usage in the developed 'western' world, i.e. the US, UK and the rest of Europe. However, cannabis is used all over the world. If cannabis itself does exert some type of gateway effect, then one would predict that this gateway effect would permeate through and be evident in all areas of the world where cannabis was used.

Again, studies examining cannabis usage in areas of the world that are culturally different from the UK and US fail to show evidence of a gateway effect inherent in cannabis usage. The foremost study of this type is probably 'Ganja in Jamaica' [RUBIN75]. This was an exhaustive study of cannabis usage in Jamaica done by Rubin and Comitas, sponsored by the US National Institute of Mental Health. It came to several important conclusions regarding heavy cannabis usage, and at the time was proclaimed as being 'the first intensive multidisciplinary study of marijuana use to be published' [SULLIVAN75]. The population of Jamaican cannabis users were heavy users of cannabis by western standards, but within their subculture, such use was not rare (although not legal). According to Hollister's brief review of the report in [HOLLISTER86]:

'The content of THC in native cannabis is generally high, estimated at severalfold that of cannabis generally supplied to users in North America. The average Jamaican user smokes seven to eight cannabis cigarettes a day.'

If the gateway theory was valid, one would expect a particularly heavy uptake in the use of hard drugs, as a result of such relatively intense cannabis exposure. However, the study found that 'The use of hard drugs is as yet virtually unknown...No one in the study had ever taken any narcotics, stimulants, hallucinogens, barbiturates or sleeping pills…'

Dr Goode summarised the results of the report. With regard to the gateway theory, he surmised that 'Nothing like that [the 'stepping-stone' hypothesis] occurs among heavy, chronic ganja smokers of Jamaica. No other drugs were used, aside from aspirin, tea, alcohol, and tobacco. The only hard drug use known on the island is indulged by North American tourists' [GOODE75].

Whilst Jamaica is the target population of Rubin's comprehensive study, it is not the only country to have this absolute lack of progression. When reviewing largely unsupported claims made about cannabis, Gieringer found that 'The cannabis-using cultures in Asia, the Middle East, Africa and Latin America show no propensity for other drugs' [GIERINGER94].

Is there a pharmacological explanation for the stepping-stone theory?

This section is concerned with the first of the two explanations for the gateway effect, entitled the 'stepping-stone theory' at the start of this document. The claim of its supporters is that there is some property of cannabis (perhaps chemical, biological or mind-altering) that makes a cannabis user go on to use harder drugs. As the IOM report puts it, '[this hypothesis]…presumes a predominantly physiological component to drug progression…' [JOY99].

As Gabriel Nahas, one of the few major proponents of the gateway theory, claimed:

'It appears that the biochemical changes induced by marijuana in the brain result in drug-seeking, drug-taking behavior, which in many instances will lead the user to experiment with other pleasurable substances' [NAHAS90].

There appears to be very little scientific evidence to back up this claim. Indeed much scientific evidence appears to directly refute this statement. According to [NORML96], 'According to much of

the scientific literature, however, this assessment [Nahas' claim] could not be further from the truth.'

In general this theory seems largely to be discredited by today's scientists. Many of the statistics in the rest of this document themselves provide empirical evidence against the likelihood of this theory being valid. The landmark Institute of Medicine report [JOY99] found that 'There is no evidence that marijuana serves as a stepping stone on the basis of its particular drug effect.'

Some research has been done that shows that THC, the primary psychoactive ingredient in cannabis, makes more of the neurotransmitter dopamine available within the brain, hence causing activation of the neurons which use dopamine as a messenger chemical [TANDA97].

In the search for proof of the existence of the stepping-stone theory this finding has been used as evidence by some supporters of the theory of a pharmacological basis for the gateway effect. The rationale behind this is that an increase in availability of dopamine within some sections of the brain is also found as a response to the use of several of the harder drugs, including cocaine and heroin. Hence, in some way, the use of marijuana primes the brain for cocaine and heroin. It should however be noted that as well as many illicit substances, both alcohol and nicotine have the same effect on dopamine. As such, even if this avenue of investigation was valid, one could not conclude that cannabis, rather than either of these two legal drugs was the 'gateway' into hard drug usage.

However, even the fact that THC allows greater availability of dopamine is not established yet. Some studies do not find the afore-mentioned dopamine effect from the intake of THC [CASTENEDA91, HERKENHAM95]. Whether or not this is the case, animal experiments have provided a further refutation; animals can recognise the difference between THC and opiates, but of more interest there is no evidence to suggest that attempting to 'prime' animals by giving them doses of THC makes them any more likely to self-administer heroin or cocaine [IVERSEN00, ZIMMER97]. This led Zimmer and Morgan to conclude that '…pharmacological explanations for a gateway effect from marijuana have no foundation.'

Is personality relevant to an individual's progression of drug use?

Each individual has a unique combination of traits, likes, dislikes, fears and other subjective attributes of this type. Relatively little is known about the workings of the brain with respect to these characteristics but it is clear to see that the personality and related characteristics play a part in whether or not an individual chooses to use drugs, and if so, which drugs they use. It is obvious that for recreational purposes, 'Anyone who uses any given drug is likely to be interested in other drugs, for some of the same reasons' [GRINSPOON97].

As these attributes of interest and willingness to experiment are not simplistically objectively measured, the vast majority of studies on drug use do not, or cannot, take these into account. For a lot of supposedly causative findings from literature on drug use, one must bear in mind the possibility that the result could have been '…caused by something else in the individual's personality or background that the researchers have not taken into account' [DRUGSCOPE00].

Cannabis is by far the most popularly used illegal substance in the UK, and so those for those interested in using drugs it is clearly the one that they are likely to start with, because of its high availability and often its reputation for being comparatively 'safe' to use. This document has already

examined the evidence that in reality most hard drug users have started with using alcohol or nicotine. These drugs are more available than cannabis, and hence for those people that wish to use drugs, these two are the likely starting substances.

Although it is hard to specify exact personal traits that predict illicit drug use, it is logical that '…many of the factors associated with a willingness to use marijuana are, presumably, the same as those associated with a willingness to use other illicit drugs' [JOY99].

The difference between alcohol, nicotine and cannabis is not only their chemical make-up. Seemingly arbitrarily, cannabis has been declared an illicit substance to own, along with what are commonly referred (in everyday life and this document) to as 'hard drugs'. This makes it a legal risk, of some size, to acquire, possess and consume. Thus, a person who tries illicit drugs presumably is willing to risk the legal consequences. In addition, as currently both cannabis and harder drugs are only available on the 'black market' purchased, by definition, from criminals, one has no assurance of quality, purity and constituents of the product. To some extent, an illicit user is usually consuming a at least partially unknown substance. Again, this is taking a risk. Ignoring the fact that no drug is entirely without dangers, by consuming an unknown substance which has been through no process of quality control or health and safety tests, a user is risking their health. Some people will not be willing to do this, and so to some extent the taking of drugs, at least in some cases, must be related to the so-called 'risk taking personality'. Therefore, one reason a person chooses to use illicit drugs of any kind may be 'a recently discovered fact of adolescent psychology - there is a personality type which uses drugs, basically because drugs are exciting and dangerous, a thrill' [JULIN94].

Likewise, the use of multiple illicit drugs, whether starting off on cannabis or not, to some extent can be 'explained by the fact that people who engage in one risk-taking behavior are likely to engage in other risk-taking behaviors' [SCHAFFER].

It should be noted that the only reason there is any association in this section between cannabis and hard drugs is that they both have similar legal classifications.

A letter published in the Wall Street journal [WALL99], stated that

'Many unbiased experts believe that the most likely relationship between the use of marijuana and harder drugs is a person's propensity for risk-taking…' The risks of using cannabis, whilst not eliminated, could be greatly lessened both in regard to health and legal measures by a reclassification of cannabis as a substance which can legitimately sold and used with regulations guaranteeing, in a similar way to alcohol, the quality of its composition. The letter continued to state that the possible route of drug use and progression with regards to the propensity of risk-taking 'may even be exacerbated by the illicit market in marijuana, created by prohibition, which routinely exposes children and adults to harder drugs'.

Is there a social explanation for the gateway theory?

This section is concerned with the second of the two explanations for the gateway effect, entitled the 'gateway theory' at the start of this document. The claim of its supporters is essentially that the culture that a cannabis user must be exposed to in order to acquire and use cannabis, an illegal drug, significantly enhances the likelihood of the user moving on to use hard drugs. As the IOM report puts

it '…marijuana serves as a gateway to the world of illegal drugs in which youths have greater opportunity and are under greater social pressure to try other illegal drugs' [JOY99]

Clearly, at least the premise is true - the legal classification of cannabis forces users to predominantly seek out illicit dealers. The exception to this is the small minority that grow their own plants but this is discouraged by both the lack of convenience for the user, the need to conceal plants and equipment for a long period of time safely, and the extra punitive measures that can legally be brought against a grower, as an illegal drug 'manufacturer'. The vast majority of cannabis users visit a 'drug dealer', whether it is in the form of a family member, a close friend, an acquaintance or a large-scale hitherto-unknown drug dealer. Many cannabis dealers, particularly those who are higher up in the hierarchy of distribution, sell harder drugs as well as cannabis. Whilst the stereotype of an evil drug pusher covertly enticing children to get hooked on heroin is largely a myth, a drug dealer usually has no incentive to discourage drug use of any kind - a salesman does not wish to alienate his clientele. One must also bear in mind that the criminality that prohibition forces on those who sell drugs is such that it may draw a higher proportion of existing criminals, perhaps with little regard for other's health. The profit on a typical sale of drugs is high enough to make amassing money the main objective in many dealers' eyes. Whether or not deliberate, this means that it is likely that a cannabis user may be exposed to other drugs. At its most innocent, illicit supplies of cannabis tend not to be guaranteed on a regular basis, and if a user cannot get cannabis they may try other 'substitute' drugs instead. Simply, 'People who use illicit drugs, in particular, are somewhat more likely to find themselves in a company where other illicit drugs are available' [GRINSPOON97].

The social gateway of theory suggests, for example that '…it could be that cannabis use involves people in the buying of illegal drugs, making it more likely that they will meet with an offer of heroin, an offer which some will accept' [DRUGSCOPE00]. It is quite feasible that had the buyer bought their cannabis legitimately in a high-street shop the thought of seeking out a source for heroin or other hard drugs would not have occurred. It is purely the parallel access to the substances that means that a cannabis user has more access to, and thus is more likely to try hard drugs, rather than any chemical effect of cannabis itself. The current drug laws are such that with regard to the supply of drugs, '…governments have unwittingly yielded control to drug dealers who do not distinguish between different drugs' [BYRNE96].

A report by Hall et al. looked into the consequences of using several types of drugs, both licit and illicit. This was done as part of the World Health Organization's 'Project on Health Implications of Cannabis Use'. It reached a conclusion that adheres to the social gateway theory - '…exposure to other drugs when purchasing cannabis on the black market, increases the opportunity to use other illicit drugs' [HALL95].

From a logical viewpoint, the social gateway theory seems to be credible. However, one must be careful to see exactly what conclusion regarding the legal policy on cannabis use should be drawn. It is important to note that this theory claims that the environment and culture a cannabis user must experience leads the user into a higher likelihood of using other (illegal) drugs. This is entirely distinct from any claim that using cannabis itself leads on to harder drugs. The solution to this problem is not to stop people using cannabis, but rather to ensure that they get their chosen drug from a source where harder drugs will not be so freely available in an unregulated fashion. The

introduction of cannabis buyers into a criminal black market is nothing inherent in the plant itself, rather it is a by-product of the legal classification that cannabis currently falls into. It is not cannabis per-say acting as a gateway drug, but rather it is '…the legal status of marijuana that makes it a gateway drug' ([JOY99], referencing [KANDEL92]).

This cannot be emphasised enough. If the Government is setting out to criminalise cannabis users partially on the basis of the fear that users may move on harder, more damaging drug use, then the law-makers achieve exactly the opposite of what they want, as '…any correlation between marijuana use and hard drug use can be linked to federal policies that place marijuana in the same underground markets as hard drugs like cocaine and heroin' [NORML96]. Indeed, some authors go further and blame the current laws for increasing hard drug abuse, with sentiments such as:

'Those who insist on keeping the plant illegal bear a serious degree of moral responsibility for young marijuana users who do go on to use cocaine, heroin, PCP or other genuinely dangerous or addictive drugs' [BOCK99].

The logical suggestion, championed by many cannabis law reformers, is to attempt to alter the law so that the cannabis market is distinct from the market for harder drugs. There are few claims of a social gateway resulting from the selling of alcohol via licensed premises leading to hard drug usage, so a solution to the negative effects of this theory would evidently be to allow cannabis to be sold in a similarly regulated fashion. Even for those who believe prohibition is an effective way to reduce the harm done to and by drug users this idea is not necessarily straightforwardly unacceptable, as the very existence of any gateway-type theory '…implicitly recognizes that other illicit drugs might inflict greater damage to health or social relations than marijuana' [JOY99].

At the time of writing, no country has fully legalised and regulated recreational usage of cannabis for an extended period of time, so empirical results of such policies are not plentiful. The best example however comes from Holland.

Do the results of the Dutch policy on cannabis show a gateway effect?

Since 1976, despite its illegal status, the Dutch have practiced 'a formal policy of nonenforcement of violations involving possession or sale of small quantities of cannabis' [IVERSEN00]. This allowed cannabis users to possess up to 5 grams of cannabis and grow a limited number of plants to supply themselves. In addition it opened the way for so-called 'coffee-shops' to sell cannabis, albeit in small quantities and with several restrictions, including forbidding any other drugs, including alcohol, from being sold on the premises. The aim of this exercise was to try and reduce any social gateway effect relating to cannabis users progressing on to harder drugs in areas which have blanket prohibition policies. It was a 'pragmatic rather than moralistic' tactic [IVERSEN00], a manoeuvre that attempted to minimise the adverse consequences of drug use. In other words, 'By separating the retail market for marijuana from the retail market for "hard drugs", they sought to reduce the likelihood of marijuana users being exposed to heroin and cocaine' [ZIMMER97]. An excerpt from a Netherlands government report confirms this: 'Tolerating relatively easy access to quantities of soft drugs for personal use is intended to keep the consumer markets for soft and hard drugs separate, thus creating a social barrier to the transition from soft to hard drugs' [MHWS95].

In summary, this change of policy seems to have been successful. Initially, there was a slight increase in cannabis usage (which has now mellowed to a level similar to that in other European countries and lower than the US), but heroin and cocaine use declined substantially [DENNIS90]. As well as the separation of markets, this shows again no correlation between prevalence of cannabis usage and that of hard drugs.

To see the success of the separating-markets policy a comparison between Holland and the US, where selling and using cannabis is strongly forbidden and enforced is informative. By 1994, 18 years after the Dutch started formally allowing cannabis usage despite its illegality, the rate of hard drug use amongst adolescents was significantly lower in Holland than in the US. The results of a national US survey [HHS95B] showed that in America 1.7% of people between the age of 12 and 17 had ever tried cocaine. In comparison, Sandwijke et al. produced a study, involving a greater subsection of the likely hard-drug using population (this time aged between 12 and 19), which found that just 0.3% of the study population in Amsterdam had ever tried cocaine [SANDWIJKE95]. Within the whole population of the respective countries, it was found that in 1995, there were 430 heroin addicts per 100,000 people in the US, and only 160 heroin addicts per 100,000 in Holland [IVERSEN00].

It was found in another study, by Cohen and Sas, that within Holland the younger members of the Dutch cannabis-using population, who grew up under the new tolerant policies on cannabis, were less likely to go on to use cocaine than the older Dutch cannabis users [COHEN97]. This trend is confirmed by the results of a study discussed in [IVERSEN00]. In 1981, 14% of Dutch heroin addicts were under 22, but by 2000, less than 5% are under 22.

When reviewing the evidence for the gateway theory from the Netherlands, the author of [NORML96] found that 1.8% of Dutch youth report having tried cocaine, and just 25% of adult cannabis users had ever used other drugs ([MORGAN95B], [COHEN96]). This led them to conclude that '…when the cannabis markets are effectively separated from the harder drugs, marijuana is clearly a "terminus" rather than a gateway drug' [NORML96].

Does cannabis exert a reverse gateway effect?

Often unmentioned is a hypothesis similar to the gateway theory, but in reverse. This theory suggests that rather than acting as a gateway drug, cannabis actively acts as a terminus drug. This is not simply that, as previously discussed, cannabis is the final drug that the vast majority of users experiment with, but rather that greater availability of cannabis leads to fewer users going on to try hard drugs.

The experience in Holland, discussed earlier, may lead one to this conclusion. Any adult can get limited amounts cannabis from a coffee shop so there is less of an availability problem than in those countries with harsher, more punitive, cannabis laws. As shown, there is typically a lesser prevalence of hard drug use in Holland than in countries such as the US and UK where purchasing cannabis is a matter of seeking out an illegal dealer. However, there are several reasons that the lesser use of hard drugs may exist, including the separation of the markets for cannabis and hard drugs. However, examples of a possible reverse gateway theory can be found in other countries where usage and purchase is not tolerated.

At the start of the 1970s, Zinberg and Weil that showed that where greater cannabis use occurred, alcohol use declined. In other words, there was a negative correlation between the usage of cannabis and that of alcohol [ZINBERG71]. Two decades on, the Rand Corporation produced a study looked at the difference, between the years of 1975 and 1978, in hard drug abuse within American states that had decriminalised cannabis at that time and those which had not. They measured the rate of hard drug abuse in terms of emergency room episodes that occurred as a result of such use. They found that typically in areas where cannabis was more available there were significantly lower numbers of visits to the ER due to hard drug use [MODEL93].

A survey by Dr. Patricia Morgan of the University of California at Berkeley, produced at a similar time, studied the consequences of a cannabis eradication program that took place in Hawaii. It was found that the program showed some success in terms of reducing cannabis use, but as a consequence many users and dealers who were previously involved with cannabis switched to using and dealing in methamphetamine, a harder drug. The researcher found a similar result in California, which had undergone a CAMP helicopter eradication program. After this program had taken place, the prevalence of cocaine use increased significantly ([HONOLULU94], reported in [GIERINGER94]). Furthermore, studies conducted in Australia confirm that 'cannabis is more often than not a substitute for other recreational substances, especially alcohol' (mentioned in [ELROD00]).

It is also interesting to note that cannabis has been used successfully as a treatment for harder drugs such as heroin, tobacco and alcohol. Details of this will not appear in this document, but for further information see [MIKURIYA70] for a study on treating alcoholism, and [GRINSPOON97] for a general review of cannabis as an addiction treatment.

What findings do major studies on cannabis have in respect to the gateway theory?

As the gateway effect is often one of the main claims made with regard to the potential harm of cannabis use, several in-depth major studies of cannabis usage have addressed the issue. To summarise, many have seemingly found that the gateway is more of an historical myth than a reality, with the exception that some have concluded that the social gateway effect is a reality. This, as mentioned, is not an argument against cannabis use, but rather the laws governing it which force it into the underground black market and expose users to the opportunity of buying and using other drugs without difficulty.

The first comprehensive study regarding cannabis done in the 20th century was the so-called 'LaGuardia Report', named after its commissioner, the Mayor of New York, Fiorello La Guardia. New York Academy of Medicine researchers conducted this study over a period of six years. The study refuted any gateway effect, finding that 'The use of marijuana does not lead to morphine or heroin or cocaine addiction' and also that 'The instances are extremely rare where the habit of marihuana smoking is associated with addiction to these narcotics' [LAGUARDIA44].

In 1972, a group of scientists and politicians were formed into a commission by the then-president of the US, Richard Nixon. This group worked under the guidance of Raymond Schafer, previously the governor of Pennsylvania. They surveyed 105 current cannabis users, and, whilst not examining the gateway theory explicitly, they noted 'that incidence of other drug use was relatively low, [even among] frequent marihuana users' [SCHAFER72].

In 1982, the Institute of Medicine published a study analysing the habits of American cannabis smokers. The study took 15 months to complete, and has been described as 'one of the most comprehensive and balanced analyses ever compiled regarding marijuana and its effects' [NORML96]. On the subject of the existence of a gateway theory, it concluded that 'There is no evidence to support the belief that the use of one drug will inevitably lead to the use of any other drug' [IOM82].

Already noted is another major study by the Institute of Medicine, regarding the medical usage of cannabis [JOY99]. After surveying the evidence, they saw no evidence of any pharmacologically based gateway effect of cannabis, saying 'There is no evidence that marijuana serves as a stepping stone on the basis of its particular drug effect.' Rather, they suggested the social theory of drug progression from cannabis, which as they acknowledged, rather than any inherent danger of cannabis, 'it is the legal status of marijuana that makes it a gateway drug'. Finally, they concluded that '[Cannabis] does not appear to be a gateway drug to the extent that it is the most significant predictor or even the cause of heavy drug abuse; that is, care must be taken not to attribute cause to association.'

The World Health Organisation's project on the health implications of cannabis use investigated the relationship between cannabis and other drugs. They noted the common sequence of drug use, that hard drug users have typically also used cannabis. However, when discussing the cause of this, they discredited the pharmacological theory, stating that 'The hypothesis that it represents a direct effect of cannabis use upon the use of the later drugs in the sequence is the least compelling' [HALL95]. In a similar fashion to the 1999 IOM report [JOY99], they were more attracted to the social theory, claiming that 'There is better support…[for the other hypothesis] that once recruited to cannabis use, the social interaction with other drug using peers, and exposure to other drugs when purchasing cannabis on the black-market, increases the opportunity to use other illicit drugs.'

In 1972 the Canadian Government produced a report regarding their largest ever study on cannabis (the so-called Le Dain report). With respect to cannabis leading on to other drugs, including heroin, they again found there was no evidence for any pharmacological gateway effect, claiming that 'Specific pharmacological properties of marijuana (or any other drug) which might lead to a need or craving for other drugs have not been discovered'. Rather, they held more credence in the social phenomenon, saying 'It would appear that dynamic and changing social and personal factors play the dominant role in the multi-drug-using patterns reported' [LEDAIN72].

Conclusions

This document has reviewed much evidence on the subject of cannabis use and theory of its potential gateway effect that leads users on to using hard drugs. This evidence predominantly seems to discredit the theory generally. The distinction between the pharmacologically-based stepping stone theory and the socially-based gateway theory is of vital importance, as they lead to different conclusions on how best to minimise hard drug usage. In summary, the evidence this document has reviewed shows that:

- The modern theory of the gateway effect regarding cannabis seems to have been initiated with an unsupported and contradictory reactionary statement from a prohibition supporter.
- The vast majority of cannabis users do not go on to use hard drugs.
- There is no correlation between prevalence of cannabis usage and hard drug usage.
- Cannabis is not usually the first drug that hard drug users have experimented with.
- There is no evidence of the gateway effect occurring in other, non-western, cultures.
- There is no reliable pharmacological evidence explaining how the gateway theory could be valid at this time.

Many major studies on cannabis usage have found no evidence for the stepping-stone effect, apart from social considerations.

These findings suggest that there is no cannabis-induced gateway effect. As a result of this, it seems that research, debate and drug policy should not be in any way based on the hypothesis that cannabis use leads people on to hard drugs. If real evidence surfaces in the future that there is a literal stepping-stone effect as a direct result of cannabis usage then the statement above should be reviewed, but at the present time the gateway hypothesis seems unlikely.

Seemingly more likely, however, is the social gateway theory. We have seen that:

- Cannabis users are forced to enter an unregulated market where hard drugs are easily available.
- When cannabis is not available, some users and dealers start using harder drugs.
- The Dutch policy of making cannabis readily available under UK alcohol-like regulations and separating the markets of cannabis and hard drugs has resulted in a much lower prevalence of hard drug use than in countries such as the UK and US where the policy is primarily prohibitionist and punitive.
- Several major studies have held some credence in the social gateway hypothesis as a (partial) explanation of drug progression.

The solution to the social gateway theory is to liberalise cannabis laws, perhaps at first to the current status of Dutch legislation, but furthermore to make the cannabis industry a legal, regulated and safer prospect. The success of the Dutch experiment is evident, but even there some contact into the criminal underworld is to be seen. Inherently in the issue of a gateway theory is the realisation that cannabis is at least significantly of lesser harm to the individual and to society than the potential harms of harder drug usage and abusage. Thus, policy makers should concentrate not on removing access to cannabis, but rather attempting to minimise the harm done to cannabis users (by educating them on safe ways of usage and providing clean, non-contaminated plant material), minimise the number of people who chose to move on to harder drugs, and minimise any harmful effects that this usage incurs. This, as can be seen in the real world today, is not a policy that can be successful under the current UK / US climate of prohibition. At the risk of repetition, the social gateway phenomenon, if existent, comes about because it is 'the legal status of marijuana that makes it a gateway drug' [JOY99].

Any explanation of the gateway theory which claims that cannabis intrinsically creates a desire for users to move on to other drugs seems to be a classic 'post hoc ergo propter hoc' (after this therefore because of this) fallacy. Correlation, if present, does not indicate causation. According to

[CSDP99], 'The gateway theory takes a statistical association between an extremely popular behavior (marijuana use) and an unpopular behavior, cocaine use and then implies that one causes the other. There is no evidence to this assertion…'. Even the National Center on Addiction and Substance abuse who released the oft-cited report showing potential 'evidence' for the gateway theory [CASA94], discussed earlier, readily admits that it has found no causal relationship between cannabis use and hard drug use.

As an example of the misinterpretation of evidence that leads to the creation of the gateway hypothesis, Zimmer and Morgan give the following analogy [ZIMMER97]:

'…most people who ride a motorcycle (a fairly rare activity) have ridden a bicycle (a fairly common activity). Indeed, the prevalence of motorcycle riding among people who have never ridden a bicycle is probably extremely low. However, bicycle riding does not cause motorcycle riding, and increases in the former will not lead automatically to increases in the latter. Nor will increases in marijuana use lead automatically to increases in the use of cocaine and other drugs'.

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