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## **Drug Use and Drug Policy in a Prohibition Regime**

Psychoactive drugs are an especially rich topic for criminological scholarship. The topic is inherently multidisciplinary, involving neuroscience, psychology, cultural anthropology, history, microeconomics, and moral philosophy. And drug policy instruments extend beyond the usual arsenal (special and general deterrence, incapacitation, rehabilitation, retribution, and persuasion) to include social work, medicine, psychotherapy, social support groups, drug maintenance clinics, and mass media campaigns.

In order to cover such a vast topic in a limited space, it is necessary to be selective, making some general observations and pointing the reader to good secondary sources. We focus primarily on the currently illicit psychoactives, giving little attention to alcohol or tobacco. We trust that every educated reader will be familiar with the arguments for analyzing licits and illicit together, and we assure skeptics that we will not neglect the core question of how prohibition shapes drug behavior and drug outcomes.

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We also limit our scope to policies and outcomes in the United States. We do this with some reluctance, because there is much more innovation in drug policy in Canada, Australia, and Western Europe than in the US, including experimentation with safe injection rooms, methadone buses, retail cannabis outlets, and government provided heroin (see MacCoun and Reuter 2001, 2002).

Most readers will have at least a passing familiarity with traditional scholarly ways of framing the topic, such as drug use as a “victimless” crime; the failure of drug prohibition and the merits of legalization; the relative merits of supply-side vs. demand-side programs; the “punitive paradigm” vs. the “public health paradigm”; and neurochemical reasons why drugs are a unique social problem.

We would not contend that any of these framings are “wrong” or misguided, just that they have become overly simplistic clichés that can stultify our thinking. We will use an analytical framework that we hope will provide a fresher and more pragmatic perspective on the topic.

We will also try to avoid some hydraulic assumptions often implicit in drug policy debates; e.g., the assumption that if one approach (e.g., drug prohibition) has lots of problems, another approach (e.g., legalization) will work better, or that if we cut back our funding of one program (e.g., interdiction), we will end up spending more on another (e.g., treatment).

It is not necessarily the case that any of our drug policy instruments, optimally deployed, will dramatically change our drug problems. Drug policies might not even be the most effective government responses, relative to, say, universal health care or

improved education (see MacCoun and Reuter 2001). And offering more of anything that works modestly well doesn't guarantee we'll do even better.

After briefly sketching out a framework for thinking about drugs, we then use it to interpret some major findings on drug use, drug harms, and drug policies. We then close by calling attention to some emerging issues that are likely to force us to do some new thinking and move beyond the clichés of late 20<sup>th</sup> century drug rhetoric.

The central empirical claim of this chapter is that existing policies have discouragingly modest effects on our drug problems. Our central normative claim is that we can advance our understanding of drug policies and outcomes by moving beyond a nearly exclusive reliance on the number of drug users as a metric for success (prevalence reduction). There are often important gains we can make in reducing the quantities that users consume (quantity reduction) and the harm that their use causes (harm reduction).

## **II. ANALYTICAL FRAMEWORK**

Framing drug policy in language of supply- vs. demand-side programs reflects the increasing diffusion of economic thinking from the businessplace to other domains of American life. The idea is that some interventions involve supply (source country controls, interdiction, drug market enforcement) while others involve demand (treatment, prevention), and that there is a drug control budget pie that can be sliced along these lines. But there are some drawbacks to this framing. As Murphy (e.g., 1994) has documented, the notion that we can simply shift monies from one portion of a federal drug budget to another is naïve; there is no single allocating authority, and the “budget” is a mythical post-hoc construction assembled from a variety of

conflicting sources and entities. And supply and demand factors are clearly interdependent and endogenous. The alternative idea of a “public health” framing of drug policy is refreshing, but in practice it tends to devolve to the “demand reduction” frame.

Instead, we will try to keep the focus on strategies, rather than tactics; goals rather than programs. Our framework for doing so is sketched here and is developed in greater detail elsewhere (MacCoun 1998; MacCoun and Reuter 2001; MacCoun, Schelling, and Reuter 1996.)

### ***A. Consequentialist vs. Deontological Positions***

Our perspective will not appeal to everyone. In particular, our framework is irrelevant for people who hold that certain moral beliefs trump any consideration of consequences. There are two such deontological positions. One is the *libertarian* belief that ingesting psychoactive substances is our birthright. At the other extreme is *legal moralism* – the belief that drug intoxication is intrinsically immoral. Based on an extensive analysis of drug policy rhetoric (MacCoun and Reuter 2001, Chapter 3), we conclude that few people are strict libertarians or pure legal moralists with respect to drugs. Most people who argue that either drug use or drug prohibition is immoral usually cite empirical arguments in support of their positions.

MacCoun and Reuter (2001, p. 66) offered a thought experiment that can help people identify where they stand with respect to consequentialism.

Imagine a newly invented synthetic psychedelic: “Rhapsodol.” Rhapsodol provides an intense (but not unduly frightening) altered state, full of intellectually and aesthetically intriguing mental imagery, and a profound sense of love for all living creatures. These sensations last for approximately 30 minutes, then vanish completely, producing absolutely

no detectable changes in one's life outlook or mental or physical functioning. They can only be experienced by sitting or lying in a completely stationary position; any abrupt physical movements end the psychedelic state and return one to a normal state. Moreover, because of neurochemical processes of adaptation, the effects can only be experienced once a day. Would you consider Rhapsodol use immoral? Should it be legally prohibited?

Readers who say yes to these questions may have be less consequentialist than deontological in their opposition to drugs.

### ***B. Goals for Drug Policy***

At this point, we bid pure libertarians and legal moralists adieu. For the consequentialists, we suggest three broad goals: *Prevalence reduction* (reducing the number of users), *quantity reduction* (reducing the amount consumed by each user), and *micro harm reduction* (reducing the average harm per dose, including harms to users and harms to non-users).

Practices and concepts most readily identified with prevalence reduction include abstinence, prevention, deterrence, and incapacitation. Practices and concepts most readily identified with harm reduction include safe-use and safe-sex educational materials, needle exchanges, and the free distribution of condoms to students (e.g., Ball 2007; Drucker et al. 1998; Marlatt 1998). Traditional discussions of prevention, treatment, deterrence, and incapacitation focus almost exclusively on the first category, with the implicit assumption that the best way to eliminate harm is to eliminate prevalence -- turning users into non-users. This is logically correct, but not very realistic. Prevalence reduction may be employed in the hope of reducing drug-

related harms, but because it directly targets use, any influence on harm is indirect.

Harm reduction directly targets harms; any influence on use is indirect.

From an analytic standpoint, all three strategies contribute to a broader goal, macro harm reduction (reducing the total harm to society). For tangible (rather than purely symbolic) harms, *Macro Harm = Micro Harm x Prevalence x Quantity*, summed across types of harm (see below). The strategies are potentially in tension, particularly if efforts to reduce prevalence increase harm (as argued by many drug policy reformers), if efforts to reduce quantity discourage abstinence (as argued by opponents of “controlled drinking”), or if efforts to reduce average harm encourage the prevalence or quantity (e.g., the argument that harm reduction “sends the wrong message”). Thus, any drug policy intervention should be evaluated with respect to all all three criteria – prevalence reduction, quantity reduction, and harm reduction – because all three contribute to the reduction of total drug harm. Note that our use of “harm reduction” is unusual here, in that we are not referring to specific “harm reduction” programs like needle exchange, but rather to a goal that is served – well or poorly – by any intervention. For that reason, we will discuss harm reduction in the context of traditional (and more widespread) interventions like policing, prevention, and treatment.

### ***C. The Causes and Bearers of Drug-Related Harm***

Why is psychoactive drug use a crime? And is there a sensible answer that also explains why tobacco and alcohol are on one side of the legal threshold, while marijuana, cocaine, the opiates, and the psychedelics are on the other? One way of tackling this question is historical, and there are a number of outstanding histories of

roles played by race, class, and economic interests in the evolution of drug, tobacco, and alcohol control (e.g., Musto 1987). Another approach is philosophical. If we were starting a society from scratch, which substances, if any, would we prohibit? The traditional first cut at this question uses John Stuart Mill's (1859/1947) harm principle: "That the only purpose for which power can be rightfully exercised over any member of a civilized community, against his will, is to prevent harm to others. His own good, either physical or moral, is not a sufficient warrant."

MacCoun, Reuter, and Schelling (1996) listed nearly 50 different categories of drug-related harm, falling into three clusters: Health, social and economic functioning, safety and public order, and criminal justice. Many are quantifiable, at least in principle (e.g., public health care costs, reduced property values near drug markets, police and court costs), but others are not (e.g., infringement on personal liberty, devaluation of arrest as a moral sanction). The authors attempted to categorize these harms with respect to two questions: Who is the primary bearer of the harm? And, what is the primary source of the harm?

None of the harms could be confidently categorized as the exclusive burden of the user; in every category of harm there was a compelling case that others (dealers, intimates, employers, the neighborhood, and/or society) also suffered the harms. Thus, the notion that drug use is a "victimless crime" seems untenable. Still, as MacCoun and Reuter (2001, p. 61) note:

[N]ot every incident of drug use harms others; in fact, the vast majority do not. ...Rather, each incident of drug use is accompanied by a risk that others will be harmed; some users, substances, settings, and modalities of use are riskier than others, but in no case is the risk zero. ...Of course, this is true to some degree of most licit human activities.

These harms to others meet the Mills criterion, but that hardly nails down the case for prohibition. MacCoun, Reuter, and Schelling argued that for over half of the harm categories, the primary source of the harm was either the illegal status of the drug, or the enforcement of that law, at least under the current prohibition regime. (For arguments and evidence on this point, see MacCoun and Reuter 2001, and the collected essays in Fish 1998).

The notion that prohibition and its enforcement are partially responsible for drug harms is perhaps best illustrated by examining the relationship between an offender's illicit drug use and his or her involvement in other crimes. A considerable literature on this relationship suggests the following conclusions (Goldstein, Brownstein, and Ryan 1992; MacCoun, Kilmer, and Reuter 2003; Parker and Auerhahn 1998; White and Gorman 2000). Drug use can promote other crimes; criminality can promote drug use; and/or both can be promoted by environmental, situational, dispositional, and/or biological "third variables." All three pathways have empirical support in at least some settings and populations. But these causal influences are probabilistic, not deterministic. Most drug users are not otherwise involved in serious crime. Finally, the drug-crime link varies across individuals, over time within an individual's development, across situations, and possibly over time periods (as a function of the dynamics of drug epidemics and, possibly, drug control policies).

#### ***D. How are Consumption and its Consequences Distributed?***

Like many things in life that are bounded at zero, the frequency distribution of drug consumption has a positively skewed log-normal shape (e.g., Edwards et al.,



1994; Everingham and Rydell 1994). If one plots the proportion of all users (vertical axis) as a function of quantity consumed (horizontal axis), most users pile up on the low (left) side of the quantity distribution, but the plot will have a long narrow right tail representing a small proportion of user who use very large quantities. As a result, the harmful consequences of substance use are not uniform, but are disproportionately concentrated among the heaviest users. Everingham and Rydell (1994) used these features to explain why cocaine-related harms remained high even as total prevalence was dropping; one sees a similar logic today in methamphetamine statistics. There is a sophisticated treatment of these distributional features and their implications for the targeting of interventions (Edwards et al. 1994), but far less little discussion in the illicit drug literature (MacCoun, 1993).

Another distributional consideration is how drug use and drug harms are distributed across geographic, class, and ethnic lines. African Americans use illicit drugs at a rate similar to (or sometimes lower than) European Americans, but they bear a disproportionate share of the law enforcement risk and market related violence. This is partly due to the fact that poorer neighborhoods lack the social capital needed to resist open-air drug markets. But it also reflects the deleterious effects of our mandatory minimum sentencing policies, discussed below.

Finally, drug problems are distributed over time. Musto (1987) argues that drug epidemics are dampened by a generational learning process in which new cohorts observe the harmful results of a drug on older users. Building on this idea, Caulkins (2005) and his colleagues have developed sophisticated models of how interventions (treatment, enforcement) may provide less or greater leverage at

different points in a drug epidemic. They argue, for example, that supply reduction measures will be more effective in the early stages of an epidemic but relatively ineffective in a large, mature, established market. Conversely, prevention and treatment may have limited effectiveness early in an epidemic – prevention because its effects are so lagged, and treatment because it interferes with generational learning about drug harms. This work is necessarily fairly speculative at present; we lack enough long term time-series data to permit serious testing of such hypotheses. But their analyses are valuable in encouraging another dimension of more strategic thinking.

### **III. EPIDEMIOLOGY**

Scholars rely heavily on counts of arrest rates and victimization reports to track trends in most categories of illicit behavior. In contrast, the literature on illicit drug use relies much more heavily on surveys of self-reported drug use, and to a lesser extent drug related medical events. This probably reflects the sheer prevalence of drug use in the population (relative to property and violent crimes), as well as the more diffuse linkage between the criminal act and any harms to innocent victims.

#### ***A. Drug Use***

In 2005, about 46 percent of Americans aged 12 and older had used an illicit drug at least once in their lifetime; 14 percent had done so in the past year, and 8 percent in the past month. Because illicit drug use is so often a fleeting encounter in adolescence, drug policy analysts usually view past-month prevalence use as a more meaningful indicator than lifetime prevalence.

The 2007 Monitoring the Future annual school survey has the longest running consistently measured time series for substance use in the US. Figure 1 shows trends in past-month prevalence for selected substances for 12<sup>th</sup> graders (Johnston et al. 2007a). Several patterns are apparent. First, alcohol remains the most common psychoactive substance among high school seniors. Second, in the most recent year (2006), monthly alcohol and cigarette use each reached their lowest recorded levels. Third, past-month marijuana use reached its peak around 1979, hit a low in 1992, and has stabilized near 20 percent for the past decade. Finally, recent use of cocaine, MDMA, or methamphetamine is fairly rare among high school seniors. MDMA use seems to have peaked at 3.6 percent in the year 2000, cocaine use has remained fairly stable at around 2 percent, and methamphetamine has dropped from 1.9 percent in 2000 to 0.9 percent in 2006.

INSERT FIGURE 1

INSERT TABLE 1

Table 1 shows past-month prevalence of various substances by age category, from the household-based 2006 National Survey on Drug Use and Health (Office of Applied Studies 2006). For each substance, young adults (18-25) were the most frequent recent users, with one exception – heroin. New heroin initiation is rare; the US heroin problem mostly involves an aging cohort of addicts who initiated use in their youth. The overall methamphetamine rates obscure the fact that prevalence

remains considerably higher in the Western US (1.2 percent) than in the Midwest and South (0.5 percent) and the Northeast (0.1 percent), and is higher among whites and Latinos (0.3 percent) than among African Americans (0.1 percent). For a decade there have been claims that methamphetamine, originally a West Coast biker drug, is spreading east, but if so, the diffusion has been fairly slow, and there is no evidence that use is significantly increasing.

The fact that someone has used a drug in the past month does not mean they use the drug frequently. As seen in Figure 2, cigarette users tend to be daily users, but most recent users of cocaine and the hallucinogens did so only once or twice in the past month. About a third of marijuana users use almost every day; surprisingly, only half as many alcohol users do so. (That difference is more rather than less pronounced if one examines only 18 to 25 year olds.)

INSERT FIGURE 2
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### ***B. Drug-Related Harms***

The prevalence of drug use provides a distorted picture of the actual health and safety harms posed by psychoactive drugs. There are several reasons for this. First, because drug use is only probabilistically related to drug harm, most harms to self and others are attributable to heavy users, and for most substances (except tobacco), a minority of users account for a majority of the quantity consumed. Second, school- and household-based surveys underrepresent hard core users, who are more likely to be truants, school dropouts, homeless, or institutionalized. To track the harmful consequences of drug use, analysts generally rely on three types of

indicators: Drug mentions in emergency room records, treatment statistics, and drug use among recent arrestees and prisoners. Table 2 shows recent data on the relative impact of the major illicit drugs on these harm indicators. As an additional index, we include the count of links produced in a search of Google News on 3 November 2007 for the terms “marijuana,” “cocaine,” “crack cocaine,” “methamphetamine,” “MDMA or (MDMA and Ecstasy),” and “heroin.”

<p>INSERT TABLE 2</p>
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Another major category of drug-related harm is the transmission of HIV. Injection drug use accounts for about a third of all AIDS cases in the US (CDC 2002), and non-injection use is associated with an elevated risk of unsafe sexual practices. But there is no reliable way to attribute some fixed percentage of AIDS cases to cocaine use, to marijuana use, and so on.

In keeping with our general analytical framework, recall that total harm is the product of prevalence  $\times$  quantity  $\times$  average harm. Thus, marijuana – by far the most prevalent illicit – accounts for a sizeable share of all three harm indicators. But relative to their much lower prevalence, it is clear that heroin, cocaine, and methamphetamine are disproportionately harmful substances. A 2007 Lancet article by David Nutt and colleagues offers what is to date the most sophisticated attempt to rate psychoactive substances by their “intrinsic” health and behavioral harms. In decreasing order of harmfulness, the worst five drugs were heroin, cocaine, the barbituates, street methadone, and alcohol. Tobacco was ninth, cannabis eleventh, LSD fourteenth, and MDMA eighteenth.

If one were starting a society from scratch, it is unclear where one might paint a bright line separating licit from illicit substances, but it is difficult to see why alcohol and tobacco would be more accessible than cannabis or MDMA. But of course, we are not starting a society from scratch. The data in Table 2 are misleading if one wants to rank the intrinsic psychopharmacological harms of drugs – marijuana looming too large – but they are valid indicators if one wants to know the contributions of different substances to social harm under the current regime and with current patterns of use. These kinds of indicators tells us little about how harmful each substance might be in a regime of regulated legal access. Average harm per use might approximate the rating levels in Nutt et al. (2007), though heroin use would become a lot safer per dose. Total harm might differ, if for example legal LSD were to become massively popular. But this might be a short term effect; societies seem to learn from experience and scale back on drugs that are obviously dysfunctional (Musto, 1971/1987).

#### **IV. MAJOR DRUG POLICY INSTRUMENTS**

The FY2008 national drug control budget allocates 36 percent of drug funding for interdiction and source-country controls, 28 percent for domestic drug law enforcement, 23 percent for treatment, and 12 percent for prevention (Office of National Drug Control Policy 2007). We can only offer a whirlwind tour of the empirical literature on these interventions. Readers can find comprehensive (and hard-nosed) assessments in recent monographs by Boyum and Reuter (2005) and the National Academy of Sciences (Manski, Pepper and Petrie 2001). The drug policy literature is enormous and yet remarkably thin, in that rigorous program evaluations

are rare. There are some valuable cost-effectiveness analyses (most famously, Rydell and Everingham 1994), but these are limited by the available descriptive data and some daunting problems of causal inference (Manski, Pepper and Petrie 2001), and many of the available evaluations were conducted by program developers, raising concerns about intellectual and financial conflicts of interest.

#### ***A. Interdiction and Source-Country Controls***

In a classic analysis, Reuter and colleagues (1988) explained why we should not expect big impacts of efforts to thwart drug production and trafficking. First, it is not possible to completely “seal the borders” against relatively small packages of chemicals that will be sold at very high prices; there are too many possible smuggling routes and tactics, and dealers are very adaptive. Second, the price structure of illicit markets is such that bulk drug products in source countries are “dirt cheap” compared to the high retail street prices in the US. At the source, the economic value is low by US standards but high by local standards. But most of the markup in US prices occurs in the last few links of the distribution chain, within US borders. For example, Caulkins and Reuter (1998) note that the wholesale price of cocaine or heroin in a source country is only about 1 percent of its US retail street price. For example \$1500 of cocaine in Colombia may be worth \$15,000 at the US border, and \$110,000 in the US retail street market. Thus even very large seizures in other countries are unlikely to have big effects on local prices.

In recent years, defense analysts have used time-series data to argue that interdiction and source-country campaigns actually do have a significant impact on street prices and US demand. But these analyses have been debunked by a National

Academy panel (Manski, Pepper and Petrie 2001), arguing that the apparent correlations are spurious and amplified by selective focus on certain source-country interventions that happened to precede short-term price drops. It does not follow, however, that we could eliminate these programs entirely without a detectable effect. Most analysts believe that interdiction risks do raise prices; it is just that there are probably steeply declining marginal returns to such efforts. Presumably, these programs serve other US political, diplomatic, and economic goals beyond drug policy, laudable or otherwise. But we could probably cut back significantly on these efforts without seeing an increase in US drug consumption.

### ***B. Arrest and Imprisonment***

It is estimated that we now have about a half a million drug offenders in state and federal prisons (Caulkins and Reuter 2006). The staggering increase in the federal prison population, and the role that drug offenses played in that increase, are shown in Figure 3; state prisons show a similar pattern. Drug arrest rates (not shown) have remained stable for in recent years, so much of the growth in the prison population has been fueled by declining parole rates.

<p>INSERT FIGURE 3</p>
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What has this massive social experiment bought us? Early in the growth period, around 1992, one could argue that it was correlated with a considerable drop in drug use relative to the late 1970s (see Figure 1 above). But this period of optimism was short-lived. By 1996, about half of the gains were gone, and levels of



use have remained fairly stable since then, even as the drug prison population continued to rise. In fact, illicit drug prices have plummeted during a period when massive law enforcement sought vigorously to make drugs more expensive (Caulkins and Reuter 2006). This is troubling, because prices do matter; contrary to widespread belief, even addicts have been shown to be sensitive to drug prices (Caulkins and Reuter 1998). From the perspective of prevalence and quantity reduction, falling prices are a serious problem. But conceivably, falling prices may be beneficial from the perspective of harm reduction, because addicts might be expected to conduct fewer income-generating crimes to feed their habit. This is another illustration of the need to confront hard tradeoffs in thinking about drug policies.

The harshness of US marijuana enforcement has long received considerable criticism, and indeed it is difficult to defend (MacCoun and Reuter 2001). But Caulkins and Sevigny (2005) warn against exaggerated concerns about unlucky marijuana smokers rotting away in a prison cell. Although 38 percent of state and federal incarcerations for drug offenses involved simple possession, “for only 2 percent of imprisoned drug-law violators was there no reason whatsoever to suspect possible involvement in distribution...depending on how strict a definition one preferred, one might argue that anywhere from 5,380 to 41,047 people were in prison in the United States solely for their drug use.” On the other hand, many who avoid time in prison do spend time in jail – as much as a third of arrestees in a study of three counties in Maryland (Reuter, Hirschfield, and Davies 2001).

More troubling is the disproportionate imprisonment of African American men. African Americans accounted for about half of all drug incarcerations (Pastore 2003, Tables 6.0001.2003 and 6.56). A major factor is the differential severity of mandatory minimum sentences for crack vs. powder cocaine. Under these laws, a dealer would have to sell 500 grams of powder cocaine but only 5 grams of crack cocaine to receive the same five-year sentence. Since crack is more likely to be sold in African American communities, this has greatly widened the racial gap in sentencing. Even putting aside the questionable pharmacological and moral aspects of this differential policy, there is no evidence whatsoever for its effectiveness in controlling crime. Caulkins and colleagues (1997) show that conventional sentencing is significantly more cost effective. Although the crack mandatory sentences were trimmed somewhat in 2007, and the Supreme Court recently acted to restore some judicial discretion in these cases (*Kimbrough v. United States*, No. 06-6330, and *Gall v. United States*, No. 06-7949, both decided on 10 December 2008). Whether these changes will translate into a closing of the large racial differential remains to be seen.

The optimal level of drug law enforcement is surely well above zero, but just as surely, well below current levels (MacCoun and Reuter 2001). Caulkins and Reuter (2006) argue that we could reduce the drug prisoner population by half without harmful consequences; they note that this would still leave us with system “a lot tougher than the Reagan administration ever was.” Kleiman (2004) suggests tactics for getting more mileage out of less punishment through the use of small, quick sanctions, strategically deployed.

### *C. Treatment*

In 2005, there were about 1.8 million people in substance abuse treatment in the US, about 40 percent for alcohol, 17 percent for the opiates, 14 percent for cocaine, and 16 percent for marijuana (Office of Applied Studies 2007c).

There are certainly many thousands of people who need treatment and are not receiving it. Whether expanding the available treatment capacity would bring them in is an open question. We should be wary of assuming that a purely “public health” approach to drugs can work; the police and courts play a crucial role in bringing people into treatment – increasingly so with the expansion of drug courts and initiatives like California’s Proposition 36, the 2001 law which permits treatment in lieu of incarceration for those convicted for the first or second time for nonviolent drug possession (see Farabee et al. 2004). For most primary drugs of abuse, criminal justice referrals are a major basis for treatment: in 2005, 57 percent of marijuana treatment, 49 percent of methamphetamine, and 27 percent of smoked cocaine. But 36 percent of clients in alcohol treatment were referred by the criminal justice system, so legal status may not be the crucial lever.

In a sophisticated cost-effectiveness analysis, Rydell and Everingham (1994) estimate that the U.S. could reduce cocaine consumption by 1 percent by investing \$34 million in additional treatment funds, considerably cheaper than achieving the same outcome with domestic drug law enforcement (\$246 million), interdiction (\$366 million), or source country controls (\$783 million). But because treatment effects are usually estimated using pre-post change scores that are vulnerable to two potential biases (Manski, Pepper and Petrie 2001). First, the posttreatment reduction could

reflect a simple “regression to the mean” in which an unusually extreme period of binge use would be followed by a return to the user’s more typical levels, even in the absence of treatment. Second, treatment pre- and posttests are vulnerable to selection biases because clients who enter and remain in treatment until post-treatment measurement are a non-random and perhaps very unrepresentative sample of all users. Regression artifacts would inflate treatment estimates; selection biases could either inflate or deflate the estimates. We believe that the full weight of the evidence makes it clear that treatment is both effective and cost-effective, but until these problems are better addressed, we cannot be sure that the benefits of expanded treatment would be as large as Rydell and Everingham implied.

Even its most passionate advocates recognize that treatment’s benefits are often fleeting. About three quarters of heroin clients and half of cocaine clients have had one or more prior treatment episodes (([Office of Applied Studies](#) 2007c). Forty to sixty percent of all clients will eventually relapse, though relapse rates are at least as high for hypertension and asthma treatment (McLellan et al. 2000). Importantly, Rydell and Everingham (1994) recognized that treatment can provide considerable health and public safety benefits *even if it only reduces drug use while the client is enrolled*. Held up to a standard of pure prevalence reduction (abstinence), treatment is unimpressive. But by the standards of quantity reduction and harm reduction, treatment looks pretty good. American providers – steeped in the Twelve Step tradition – recoil at the phrase “harm reduction” – but it is a service that they can and often do perform quite well.

Perhaps the most socially beneficial treatment modality is one that some are reluctant to view as treatment at all – methadone maintenance for heroin addicts. In 2006, there were 254,049 people receiving methadone, only about 20 to 25 percent of all opiate addicts in the US (Office of Applied Studies 2006). The gap is partly due to spotty service provision outside major cities, but in even urban centers, many addicts won't voluntarily seek out methadone, preferring heroin even with its attendant risks. But Switzerland, the Netherlands, and Germany have amassed an impressive body of evidence that hard-core addicts significantly improve their health and reduce their criminality when they are able to obtain heroin directly from government clinics (van den Brink et al., 2003). Similar ideas were rejected in the US several decades ago, but perhaps it is time for a second look (MacCoun and Reuter 2001).

#### ***D. Prevention***

In the US, the dominant form of prevention takes place in the classroom, generally administered by teachers (Anderson, Aromaa and Rosenbloom 2007). Ironically, prevention is the least well funded but most thoroughly tested drug intervention. Drug prevention has very modest effects on drug and alcohol use; e.g., the mean effect size in the most recent comprehensive meta-analysis was about 1/20th of a standard deviation (Wilson, Gottfredson, and Najaka 2001). Considering that 1/5<sup>th</sup> of a standard deviation is usually considered the benchmark “small” effect size, this is not very encouraging. Making matters worse, the single most popular program, Drug Abuse Resistance Education (DARE), accounts for nearly a third of all school prevention programs (Anderson, Aromaa and Rosenbloom 2007), but numerous studies show it has little or no detectable effect on drug use (Ennett et al.

1994). It is not clear whether its ineffectiveness stems from its curriculum or from its reliance on classroom visits by police officers.

But classroom based prevention is quite inexpensive, so it doesn't have to be very effective to be cost-effective. Caulkins and colleagues (1999) estimate over \$800 in social benefits from an average student's participation, for a cost of only \$150. Most of the benefits involve tobacco prevention, then cocaine, and only minimally marijuana. Classroom-based prevention materials can't be effective if the messages aren't salient in real-world settings where drug taking opportunities occur. But a well-funded campaign of magazine, radio, and television ads by the Office of National Drug Control Policy appears to have had no positive impact on levels of use (and possibly some negative impact; see US Government Accountability Office 2007).

We should be wary of thinking we have evaluated "the impact of mass media"; it may just be that the messages we've been using aren't very helpful. Note that our prevention messages are almost exclusively aimed at prevalence reduction (i.e., primary prevention -- "don't use") rather than quantity reduction ("use less") or harm reduction ("this kind of use is particularly dangerous"). A greater emphasis on secondary prevention and harm reduction might have real payoffs with respect to social costs, but we won't know unless we try (Rosenbaum, 2007). Evidence from classroom sex education is instructive in this regard; programs that teach safe sex are reliably more effective at reducing risky behavior than are abstinence-based programs (Kirby, Laris, and Rollieri 2007; Trenholm et al., 2007).

## V. THE NEAR FUTURE

We can hazard some guesses about where American drug policy might head in the future. The medical marijuana movement is likely to diminish in visibility as sprays like Sativex reduce the role of marijuana buyers' clubs, yet adult support for marijuana legalization will continue to increase as the tumultuous "generation gap" of the 1960s becomes a distant memory. Methamphetamine will soon peak, if it hasn't already (in the US if not in Europe), leaving us to deal with a costly aging cohort of addicts, much like our earlier heroin epidemic. And vaccines against nicotine and cocaine addiction may soon hit the market, with both desirable and unintended consequences (MacCoun 2004).

But rather than developing the case supporting these speculations, we close with two trends that are already well underway, each of which has the potential to seriously subvert current cultural assumptions about drugs and drug control.

### *A. The Thizzle Scene*

The conventional wisdom is that ecstasy (MDMA) is a "love drug" or "empathogen," and that it is the drug of choice for European and Asian American college students and young professionals. But there are many reports of increased ecstasy use by minorities living in several cities (NIDA, 2003). Many observers have noted its prevalence in the "hyphy" movement and the associated rap music (Hix 2006; Lee 2006; Swan 2006). There is evidence of an increase in the number of references to ecstasy use in hip-hop music starting in 1996 (Diamond 2006). The reported rise in ecstasy use in the hip-hop scene has ignited alarming claims that

ecstasy is “the new crack” (e.g., Cloud 2001; Swan 2006); a CBS television story asked whether Ecstasy was a “hug drug or thug drug” (CBS Broadcasting, 2007).

In fact, researchers have only begun to examine the diffusion of ecstasy into inner-city neighborhoods (Boeri et al. 2005; Urbach, Reynolds, and Yacoubian 2003; Yacoubian 2002). There is laboratory evidence of heightened aggression in the week following MDMA ingestion (e.g., Hoshi et al. 2006), but in a 2001 study of arrestees, ecstasy use was not associated with race, and negatively associated with arrest for violent crimes (Hendrickson and Gerstein 2005). It is also unclear whether self-reported “ecstasy” use always involves MDMA, as opposed to closely related drugs like methamphetamine (Avni 2007, but see Parrot 2004). Thus the emerging “thizzle” scene does raise intriguing questions about psychopharmacology, culture, and their intersection, but whether there is any meaningful causal connection between Ecstasy, race, and crime is far from certain.

### ***B. Cognitive Performance Enhancers***

Earlier, we offered a thought experiment about a hypothetical drug called Rhapsadol. We now ask the reader to consider a newly created synthetic stimulant, “Quikaine.” Quikaine targets the neural system by increasing the speed of ion transfer between synaptic gaps. Thus, it reduces reaction time and increases the speed with which physical tasks can be accomplished. It in no way alters the user’s emotional state either during or after the drug is in the system. Neither does it affect intellectual functioning. Second, consider “Intellimine.” Its sole impact on the human body is to improve cognitive capacity; it has no other emotional or physical impact, and no lingering effect on mental functioning once the drug leaves the system. In addition,



because variants of this drug have been used for decades to help with ADHD/ADD and Alzheimer's it has a long and empirically sound safety record. In fact, children and the elderly receive maximum benefit of the drug.

How should we regulate these drugs? Should they be legally available for purchase by adults? If not, are there more limited circumstances in which their use might be acceptable? For example, would Quikane's use be warranted by those charged with protecting others from danger, such as certain military operatives or police officers? What about for completing tasks faster and more safely, such as on an assembly line? How about for simply reducing the amount of time spent on household chores? Should we allow surgeons, crisis managers, and other high-stakes problem solvers to take Intellimine?

These drugs are hypothetical, but new synthetics already have some of their properties, and there is every reason to expect rapid advances in the development of performance enhancers in the near future (see Farah et al. 2004; Turner and Sahakian 2006). They will raise vexing questions about personhood, agency, freedom, and virtue. For centuries, we have associated psychoactive substances with the pursuit of purely personal goals: fun, seduction, escape, transcendence, ecstasy. New drugs like Intellimine and Quikane will force us to come to grips with a radically new framing: Drug use as a tool for enhanced economic competitiveness. Parents who now worry about how marijuana might jeopardize their children's Ivy League prospects may soon worry about whether abstinence lowers SAT scores. Employers who now screen urine for marijuana may come to view abstainers as slackers. It will

be fascinating to see how we learn to reconcile these new pressures with our traditional attitudes toward drugs.

### ***C. Priorities for Future Research***

We close with a brief list of topics that are sorely in need of research attention. Rather than a long wish list, we confine our attention to priorities that are implied by our analytical framework; specifically, the argument that quantity reduction and harm reduction deserve a more equal footing with prevalence reduction.

The first priority is to give far greater attention to the development of quantity and harm indicators in epidemiological research. Our national drug surveys devote far more attention to prevalence than to dosage, settings of use, or consequences of use, and the reliance on household and classroom populations overrepresents casual users and underrepresents the heaviest users (see Manski et al., 2001). And we would like to see the Goldstein et al. (1992) analysis of types of New York drug-related deaths replicated in many different cities on a periodic basis (MacCoun, Kilmer, and Reuter, 2003).

The second priority is to incorporate more sophisticated quantity and harm measures into drug policy program evaluations. We rarely evaluate drug law enforcement, and when we do we typically seek changes in drug use without considering effects on patterns of drug use, much less the harms of drug use and the harms of aggressive policing. Treatment and prevention evaluators do attend to changes in quantity as well as prevalence, but they devote far less attention to changes in the harms. They are particularly resistant to assessing the possibility that participants who continue using might develop less harmful patterns of use.

Finally, we would endorse a greater willingness to directly test interventions designed to directly reduce drug-related harm. Only needle exchange has received much study in the US, much of it conducted in without any federal research support. More radical proposals like safe injection sites, “safer use” education, and government-regulated heroin maintenance have been completely off the table despite receiving serious investigation in Europe. A more open inquiry could establish whether such policies are harmful or helpful, and it would do much to help restore the perceived legitimacy of the US drug control establishment among elites and ordinary citizens alike.

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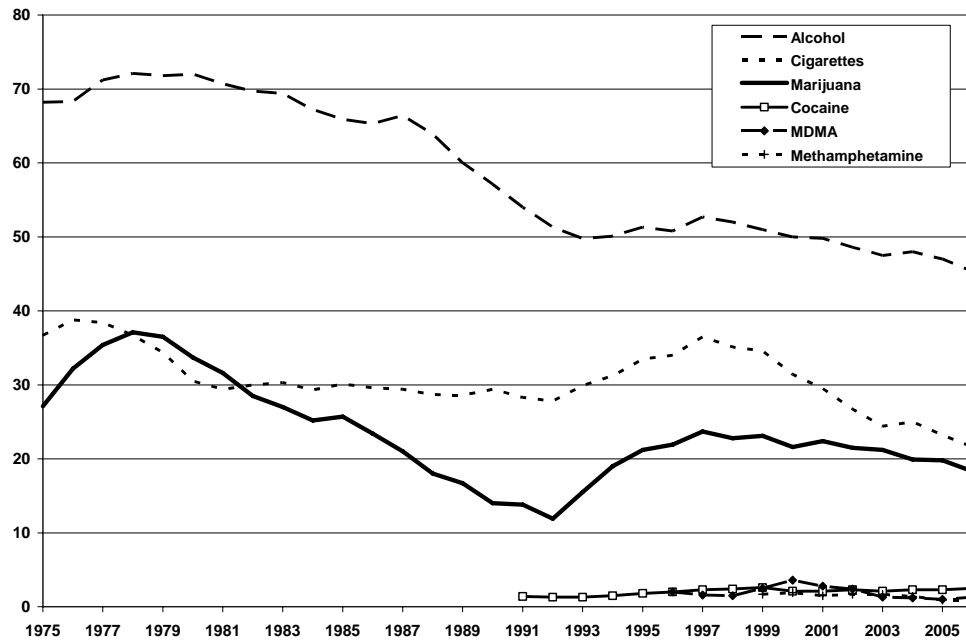


Figure 1. Trends in 30-day prevalence among 12<sup>th</sup> graders. (Source: The Monitoring the Future Study; The University of Michigan)

Table 1. Prevalence of Use in the Past Month (%), By Age, NSDUH 2006

	Age Group		
	12 to 17	18 to 25	26 and older
Alcohol	16.6	61.9	53.7
"Binge" Alcohol Use	10.3	42.2	21.4
Cigarettes	10.4	38.4	24.7
Marijuana	6.7	16.3	4.2
Non-medical use of prescription psychotherapeutics	3.3	6.4	2.2
Cocaine	0.4	2.2	0.8
Hallucinogens	0.7	1.7	0.1
Methamphetamine	0.2	0.6	0.3
Heroin	0.1	0.1	0.2

Entries are percentages of each age category in the 2006 US household population.

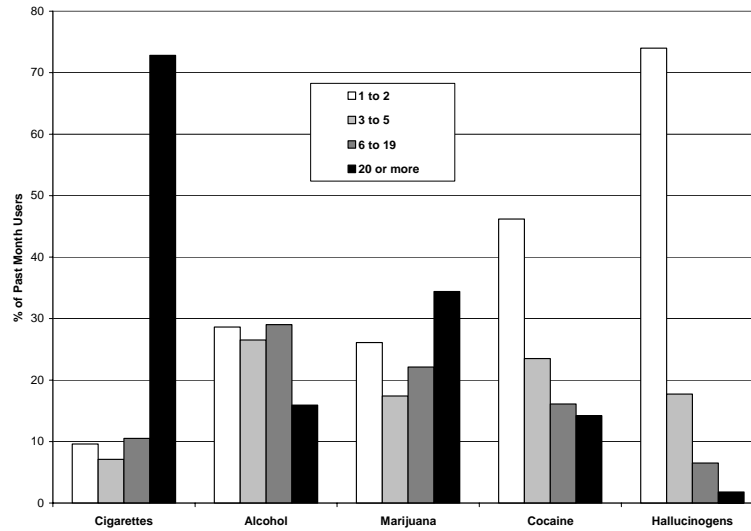


Figure 2. Number of days used in past month among past month users, ages 12 and older, in 2006, (SAMHSA, National Survey on Drug Use and Health, 2006)

Table 2. Relative Contribution of Major Illicit Drugs to Various Harm Indicators.

	Drug-related Emergency Room Visits, 2007 DAWN	Primary Drug in Admissions to Treatment Programs, 2005 TEDS	Median Percent of Arrestees Testing Positive (2003 ADAM)	Past Month Use Among State Prisoners (prior to offense), 2004	<i>Google News</i> mentions (11/3/07)
All illicit drugs	56.4	-	70.3	56.5	-
Marijuana	16.7	15.8	44.1	39.2	21,463
Cocaine	30.9	3.9	30.1	25.0	20,459
Crack	-	10.0	-	-	3,453
Methamphetamine	7.5	8.2	4.7	10.8	3,771
MDMA (Ecstasy)	0.7	0.9	-	5.9	2,853
Heroin/opiates	11.4	13.8	5.8	8.2	7,142



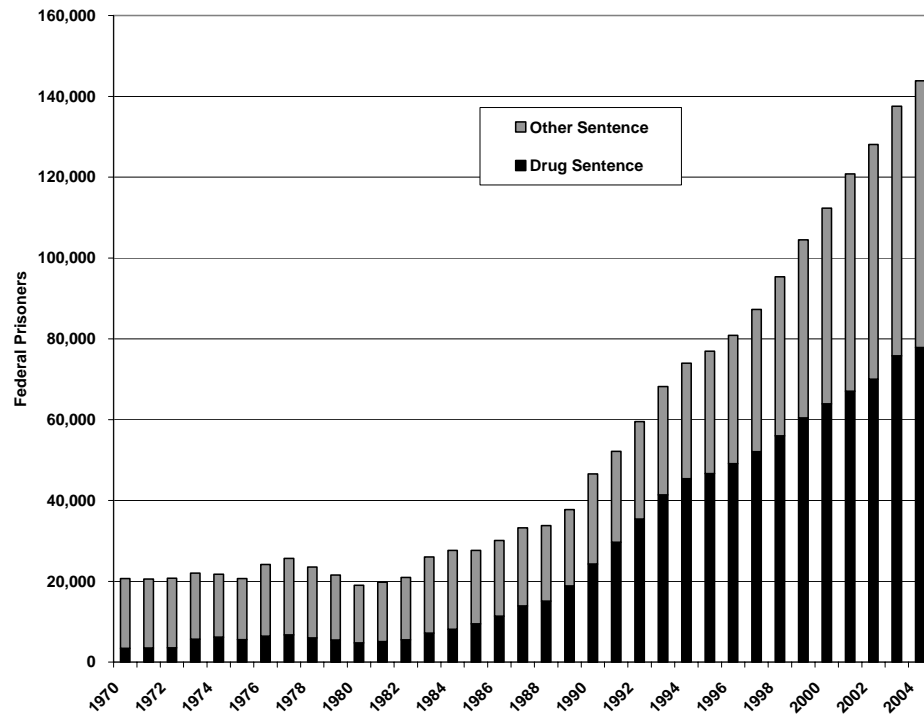


Figure 3. Increase in the federal prison population for drug and non-drug offenses, 1970-2004.