

# The Limited Relevance of Drug Policy: Cannabis in Amsterdam and in San Francisco

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There is a trend among Western democracies toward liberalization of cannabis laws. (Cannabis includes both marijuana and hashish.) In 1976, the Netherlands adopted de facto decriminalization. Under Dutch law, possession remains a crime, but the national policy of the Ministry of Justice is to not enforce that law. After 1980, a system of “coffee shops” evolved in which the purchase of small quantities of cannabis by adults was informally tolerated and was then formally permitted in shops that were licensed.<sup>1–3</sup> During the 1990s, Switzerland, Germany, Spain, Belgium, and Italy shifted their drug policies in the Dutch direction. Portugal decriminalized cannabis in 2001, and England similarly reclassified cannabis in 2004. Canada and New Zealand are currently considering cannabis decriminalization. These shifts constitute the first steps away from the dominant drug policy paradigm advocated by the United States, which is punishment-based prohibition.<sup>4–6</sup>

Moving in the opposite direction, the United States has stiffened criminal penalties for drug offenses and has increased arrests for cannabis offenses. Since 1996, voters in 8 states and the District of Columbia have passed medical-marijuana initiatives, but the federal government has resisted implementation. In 2001, 723 627 people were arrested for marijuana offenses.<sup>7</sup> In 2002, the Drug Enforcement Administration began raiding medical-marijuana organizations,<sup>8</sup> and the White House Office of National Drug Control Policy launched a campaign against marijuana.<sup>9,10</sup>

Such policies are designed to deter use. The core empirical claim made by criminalization proponents is that, absent the threat of punishment, the prevalence, frequency, and quantity of cannabis use will increase and will threaten public health.<sup>11–16</sup> The question of whether deterring use enhances public health was beyond the scope of our study, but we

**Objectives.** We tested the premise that punishment for cannabis use deters use and thereby benefits public health.

**Methods.** We compared representative samples of experienced cannabis users in similar cities with opposing cannabis policies—Amsterdam, the Netherlands (decriminalization), and San Francisco, Calif (criminalization). We compared age at onset, regular and maximum use, frequency and quantity of use over time, intensity and duration of intoxication, career use patterns, and other drug use.

**Results.** With the exception of higher drug use in San Francisco, we found strong similarities across both cities. We found no evidence to support claims that criminalization reduces use or that decriminalization increases use.

**Conclusions.** Drug policies may have less impact on cannabis use than is currently thought. (*Am J Public Health.* 2004;94:836–842)

did examine the proposition that drug policies affect user behavior and deter use. It is possible that the causal arrow points the other way—that user behavior affects laws and policies, which has been the case with alcohol policies in some countries.<sup>17</sup> However, the Marijuana Tax Act of 1937, which first criminalized cannabis, predated widespread cannabis use in the United States and had clear political origins.<sup>18–21</sup> In the Netherlands, de facto decriminalization of cannabis was first forged in the late 1960s, when use was spreading among the youth counterculture. But Dutch policymakers decided that cannabis use was unlikely to lead to deeper deviance and that criminalization could lead to greater harm to users than the drug itself.<sup>3</sup> In neither country, then, was user behavior the effective cause of laws or policies.

The presumed effects of cannabis policies have been explored by those who are critical of criminalization in the United States<sup>22</sup> and by those who are skeptical of Dutch decriminalization.<sup>23</sup> However, until now there have been no rigorously comparative studies of user behavior designed to assess whether criminalization constrains use or whether decriminalization increases it. Our study compared the career use patterns of representative samples of experienced cannabis users in 2 cities with many similarities but with differ-

ent drug-control regimes—Amsterdam, the Netherlands (decriminalization), and San Francisco, Calif (criminalization).

San Francisco was selected as the US comparison city not because it is representative of the United States but because it is the US city most comparable to Amsterdam. Both cities are large, highly urbanized port cities with diverse populations of slightly more than 700 000. They are financial and entertainment hubs for larger regional conurbations, and they have long been perceived within their home countries as cosmopolitan, politically liberal, and culturally tolerant.

Law enforcement officials in San Francisco are not as zealous about enforcing marijuana laws as law enforcement officials are in most other US cities. Nonetheless, San Francisco is embedded in the drug policy context of criminalization, which is a markedly different drug policy context than that of Amsterdam. Buying and selling cannabis are permitted in Amsterdam in 288 licensed “coffee shops,”<sup>24</sup> and public use is permitted, whereas in San Francisco, buying, selling, and public use of marijuana remain criminal offenses. In Amsterdam, there is neither proactive nor reactive policing of use or low-level sales, although police do enforce regulations against coffee shops’ advertising, selling to minors, and creating public nuisances.

In San Francisco, there is strong proactive and reactive policing of sales, and there is moderate reactive policing of use.

These differences in drug policy context are palpable to users. San Francisco students are suspended from schools and are placed in treatment for marijuana use. San Francisco users risk citations, fines, and arrests if they are detected buying, possessing, or using marijuana. In Amsterdam, users face none of these risks. The use and sale of other illicit drugs sometimes used by cannabis users is proactively policed in San Francisco. In Amsterdam, police occasionally engage in reactive policing of complaints about open use or sale of other drugs, but they do not proactively patrol in search of these offenses.

## METHODS

We required not merely a random sample of cannabis users but a random sample of users who had enough experience (defined as at least 25 episodes of use during their lifetimes) to answer questions about career use patterns. In Amsterdam, recruitment of users began as part of a drug-use prevalence survey of the general population. This survey was administered to a random sample that was obtained from Amsterdam's Municipal Population Registry. The overall response rate was 50.2%, which yielded a sample of 4364.<sup>25</sup> (The response rate was slightly below the 55% response rate of a 1990 iteration of the survey. Sampling details and an extensive response/nonresponse study can be found in Sandwijk et al.<sup>24</sup> or at <http://www.cedro-uva.org/lib>.) Comparisons of responders with nonresponders and with known city demographic data indicated no need for weighting. All respondents who reported having used cannabis at least 25 times ( $n=535$ ; 12.3%) were asked to participate in an in-depth interview about their cannabis use. Of these 535 experienced users, 216 (40.5%) were interviewed in 1996.<sup>26</sup>

This modest response rate necessitated a check of representativeness. We compared the 216 users who responded with the 319 who did not on 12 demographic and drug-use prevalence variables. Respondents had slightly higher levels of formal education and slightly higher past-year prevalence of cannabis

use,<sup>26,27</sup> but otherwise, they showed no differences compared with nonrespondents and thus were reasonably representative of experienced cannabis users in the general population. Homeless and institutionalized persons were not interviewed for either survey.

Beginning in 1997, the Amsterdam survey of experienced cannabis users was replicated in San Francisco, where there is no population registry. To remain consistent with Amsterdam, we first drew an area probability sample by randomly selecting census tracts, blocks, buildings, households, and adults within households. We administered a brief prevalence survey containing demographic and drug-use prevalence questions. Unlike the Amsterdam prevalence survey, which was an extensive study in its own right, the brief prevalence survey in San Francisco was principally designed to generate a random representative sample of experienced cannabis users.

The overall response rate of the San Francisco prevalence survey was 52.7%, which yielded a sample of 891.<sup>28</sup> Of these respondents, 349 reported that they had used cannabis 25 or more times (39.2% of the population sample and 3 times the prevalence found in the Amsterdam sample) and were asked to participate in the in-depth interview; 266 (76.2%) respondents were ultimately interviewed in-depth about their career use patterns. As a check on their representativeness, respondents were compared with nonrespondents on 10 demographic and drug-use prevalence variables. No statistically significant differences were found.

The Dutch questionnaire was translated for use in San Francisco. Non-English-speaking Asian Americans were excluded because of the prohibitive costs of translating instruments and training interviewers in the many Chinese and other Asian languages found in San Francisco. This exclusion was not consequential, because national prevalence studies show that illicit drug use among Asian Americans is the lowest of any ethnic group.<sup>29</sup> Also, non-English speakers are mostly elderly and are thus least likely to be cannabis users. However, the instruments were translated into Spanish, and bilingual interviewers conducted interviews when necessary. Homeless and institutionalized persons were not interviewed.

## RESULTS

### Age at Onset, First Regular Use, and Maximum Use

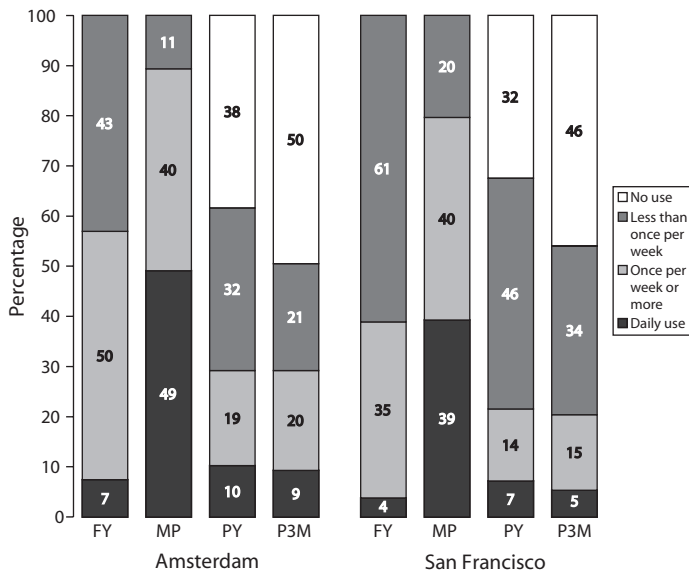
The mean age at onset of cannabis use was nearly identical in both cities: 16.95 years in Amsterdam and 16.43 years in San Francisco. The mean age at which respondents commenced regular use ( $\geq$  once per month) also was nearly identical: 19.11 years in Amsterdam and 18.81 years in San Francisco. The mean age at which respondents in both cities began their periods of maximum use was about 2 years after they began regular use: 21.46 years in Amsterdam and 21.98 years in San Francisco. Clear majorities in both cities reported periods of maximum use of 3 years or less.

### Cannabis Use Patterns Over Time

We asked about the frequency and the quantity of use and the intensity and the duration of intoxication. To assess how these dimensions of use may have changed over time, we asked about each for 4 periods: first year of regular use ( $\geq$  once per month), maximum-use period, past year (12 months before the interview), and past 3 months (3 months before the interview).

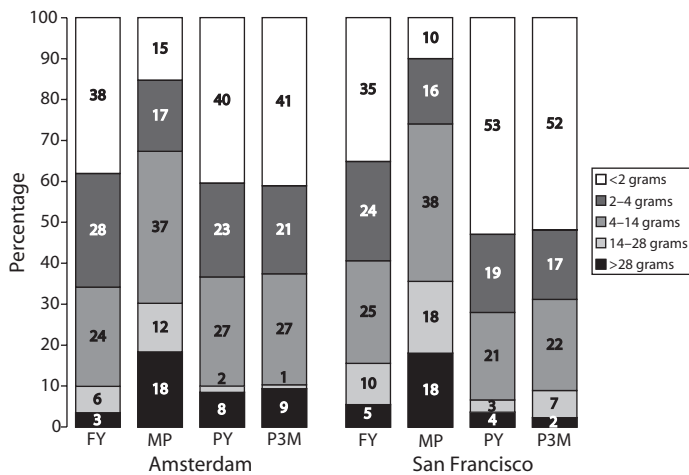
*Frequency of use.* Figure 1 shows the frequency of reported marijuana use for these 4 periods; the overall pattern is similar across both cities. During first year of regular use, strong majorities reported use of cannabis once per week or less, whereas small percentages reported daily use. Frequency increased during the period of maximum use but declined sharply thereafter. Amsterdam respondents reported more frequent use than did San Francisco respondents during their first year of regular use ( $t=4.019$ ;  $df=479$ ;  $P=.000$ ) and during their period of maximum use ( $t=2.979$ ;  $df=479$ ;  $I=.003$ ). When the maximum-use period was compared with the past year, daily use declined from 49% to 10% in Amsterdam and from 39% to 7% in San Francisco. This decline was even greater for the past 3 months.

The basic trajectory of frequency of use across careers was parallel in both cities. Most users reported a maximum-use period of 2 to 3 years, after which the vast majority sharply reduced their frequency of use or stopped al-



Note. FY = first year of regular use ( $\geq$  once per month); MP = maximum-use period; PY = past year; P3M = past 3 months.  
<sup>a</sup>All respondents.

FIGURE 1—Frequency of cannabis use for 4 periods, by city (%).<sup>a</sup>



Note. FY = first year of regular use ( $\geq$  once per month); MP = maximum-use period; PY = last year; P3M = past 3 months.  
<sup>a</sup>Respondents who still used at time of survey, for past year and past 3 months.

FIGURE 2—Average quantity of cannabis used per month (%).<sup>a</sup>

together. Roughly three fourths of the respondents in each city reported that they had used cannabis less than once per week or not at all in the year before the interview.

**Quantity of use.** Figure 2 shows that in the first year of regular use, few respondents in either city consumed large quantities of can-

nabis. Only 3% in Amsterdam and 5% in San Francisco used 28 grams (approximately 1 ounce) during an average month. Amsterdam respondents used significantly smaller quantities than did San Francisco respondents during this period. When the 2 smallest categories were combined, two thirds in Amsterdam

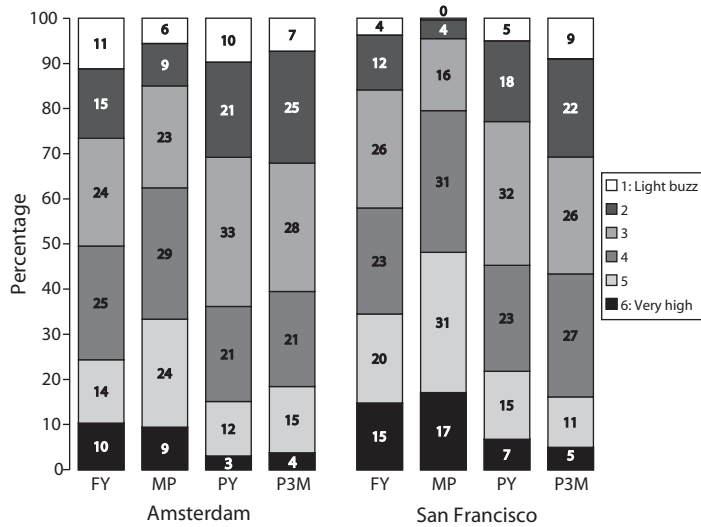
(66%) and slightly less in San Francisco (59%) were found to have consumed 4 or fewer grams per month during their first year of regular use. More than one third used less than 2 grams per month during their first year of regular use—38% in Amsterdam and 35% in San Francisco.

Quantities consumed during maximum-use periods were larger and very similar across the cities. About two thirds of respondents consumed an average of 14 or fewer grams per month—69% in Amsterdam and 64% in San Francisco. Less than 1 in 5 respondents in each city (18%) consumed an average of 28 grams per month or more during their maximum-use periods.

During the year before the interview, consumption among those who still used cannabis declined sharply. Clear majorities used 4 or fewer grams per month, although this proportion was smaller in Amsterdam (63%) than in San Francisco (72%) ( $t = 2.207$ ;  $df = 297$ ;  $P = .028$ ). About 1 in 3 respondents in each city reported no use. Overall, the patterns were parallel in both cities; quantities used increased from first regular use through maximum use but then quantities used declined steadily or use ceased altogether over the course of the respondents' careers.

**Intensity of intoxication.** Respondents were asked to estimate "how high or how stoned you generally got" when they consumed cannabis. Some recalled this occurrence with greater consistency than did others, but all of them were able to make basic ordinal distinctions between more- and less-intense highs. To increase reliability of respondents' estimates, we displayed a 6-point scale ranging from "light buzz" (1) to "very high" (6) and asked them to select the number that best summarized their highs during each period.

Figure 3 shows that respondents in both cities generally increased the intensity of their highs during periods of maximum use but moderated their highs thereafter (past-year and past-month figures exclude those who had quit). Amsterdam respondents were significantly more likely than San Francisco respondents to report milder intoxication during the first year of regular use and during maximum-use periods: mean scores for the first year were 3.5 in Amsterdam and 3.9 in San



Note. FY = first year of regular use ( $\geq$  once per month); MP = maximum-use period; PY = past year; P3M = past 3 months.  
<sup>a</sup> Respondents who still used at time of survey, for past year and past 3 months.

**FIGURE 3—Intensity of intoxication during typical occasion of cannabis use (%).<sup>a</sup>**

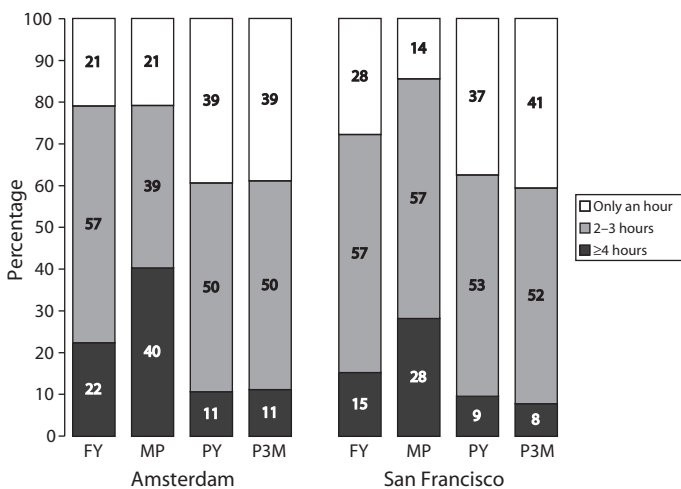
San Francisco ( $t=-3.180$ ;  $df=476$ ;  $P=.002$ ), and these scores rose for maximum-use periods to 3.9 and 4.4, respectively ( $t=-4.932$ ,  $df=413$ ;  $P=.000$ ).

The same pattern was found for the more recent periods, although the mean scores declined. The proportion of respondents who chose 6 (very high) remained small and was

between 3% and 7% in both cities. For highs experienced during the past year, Amsterdam respondents were again more likely to report milder intoxication ( $t=-2.233$ ;  $df=310$ ;  $P=.026$ ). For the past-3-month periods, majorities in both cities reported milder highs of 1 to 3 on the 6-point scale. In short, respondents in both cities reported

less intoxication with use over the course of their careers.

*Duration of intoxication.* We also asked “about how long” respondents were high during a typical occasion of cannabis use. Reported durations were correlated with frequency and with quantity but were not a function of frequency and quantity alone. Here, too, we found a tendency toward moderation over the course of users’ careers in both cities. Figure 4 shows that Amsterdam respondents reported highs of somewhat longer duration than reported by respondents in San Francisco during the first year of regular use ( $t=2.329$ ;  $df=476$ ;  $P=.020$ ). (One reviewer noted a divergence between San Francisco respondents, who reported more intense highs during 3 of the 4 periods, and Amsterdam respondents, who reported highs of longer duration during 1 period. Because we found no reason to suspect that either sample played up or played down their responses to any of the questions, this divergence may indicate culture-specific consumption styles or cultural grammars of intoxication.<sup>30,31</sup>) However, during the other 3 time periods there were no significant differences: in each city, a clear majority of users regulated their ingestion so that highs lasted 2 to 3 hours or less. Substantial minorities in each city reported being high for 4 or more hours during maximum-use periods, but these proportions dropped sharply after those periods. Of those who used cannabis during the 3 months before the interview, 89% in Amsterdam and 93% in San Francisco reported being high for 2 to 3 hours or less.



Note. FY = first year of regular use ( $\geq$  once per month); MP = maximum-use period; PY = past year; P3M = past 3 months.  
<sup>a</sup> Respondents who still used at time of survey, for past year and past 3 months.

**FIGURE 4—Duration of high during a typical occasion of cannabis use (%).<sup>a</sup>**

**Overall Career Use Patterns**

We also asked respondents to characterize their overall career use patterns. We presented a typology of trajectories<sup>32</sup> and asked them to identify the 1 that “best describes” their cannabis use over time (Table 1).

Two career use patterns were dominant in both cities. Pattern 4—gradual increased use followed by sustained decline—was the most common (49.4% of the combined sample). The second most common was Pattern 6—wide variation over time (24.4% of the combined sample). Patterns 1, 2, 3, and 5 were each selected by only 6% to 8% of the com-

**TABLE 1—Trajectories of Overall Career Use**

Pattern	Amsterdam, No. (%)	San Francisco, No. (%)
1: declining	17 (7.9)	18 (6.8)
2: escalating	13 (6.0)	17 (6.4)
3: stable	24 (11.1)	5 (1.9)
4: increase/ decline	104 (48.1)	133 (50.4)
5: intermittent	7 (3.2)	25 (9.5)
6: variable	51 (23.6)	66 (25.0)
Total	216 (100.0)	264 (100.0)

Note.  $\chi^2 = 24.047$ ;  $df = 5$ ;  $P = .000$ . Pattern names listed as shown to respondents.

bined sample. Pattern 3—stable use from the beginning onward—was selected significantly more often by Amsterdam respondents (11.1%) than by San Francisco respondents (1.9%), whereas Pattern 5—intermittent use (many starts and stops over time)—was selected significantly more often by San Francisco respondents (9.5%) than by Amsterdam respondents (3.2%).

These findings are consistent with findings on frequency and quantity of use and intensity and duration of intoxication, and they have important public health implications. Claims that cannabis produces addiction or dependence<sup>13–15</sup> lead one to expect that many experienced users would report Pattern 2—escalation of use over time. But this pattern was reported by only 6% in both cities, which means that 94% of respondents had overall career use patterns that did not entail escalation across careers.

### Other Illicit Drug Use

Another important question about the effects of drug policies concerns the use of other illicit drugs. The “separation of markets,” in which lawfully regulated cannabis distribution reduces the likelihood that people seeking cannabis will be drawn into deviant subcultures where “hard drugs” also are sold is one public health objective of Dutch decriminalization.<sup>1–3</sup> The reduction of cannabis use and thereby the reduction of the extent to which it serves as a “gateway” to “harder” drugs is one public health objective of US criminalization.<sup>11,12,14,16</sup>

**TABLE 2—Prevalence of Other Illicit Drug Use, Lifetime and During the Past 3 Months**

	Amsterdam (n = 216)		San Francisco (n = 264)		Significance $\chi^2$	
	LTP	P3MP	LTP	P3MP	LTP	P3MP
Cocaine	48.1	9.3	73.2	7.5	*	NS
Crack	3.7	0.5	18.1	1.1	*	<sup>a</sup>
Amphetamines	37.5	1.9	60.4	4.5	*	NS
Ecstasy	25.5	9.3	40.0	6.4	*	NS
Opiates	21.8	0.5	35.5	2.7	*	<sup>a</sup>

Note. LTP = lifetime period; P3MP = past 3 months; NS = not significant.

<sup>a</sup>Too few cases in cells to compute statistical test.

\* $P < .001$ .

Users who had ingested cannabis 25 times or more during their lifetimes were far more prevalent in San Francisco than in Amsterdam, and the same was true for users of other illicit drugs. Table 2 shows a significantly lower lifetime prevalence of other illicit drug use in Amsterdam than in San Francisco. During the 3 months before the interview, prevalence of crack and opiate use also were significantly higher in San Francisco, but cocaine, amphetamine, and ecstasy use were not significantly different. Thus, rates of discontinuation—the decline from lifetime prevalence to prevalence during the past 3 months—were somewhat higher in San Francisco for cocaine, amphetamine, and ecstasy; however, rates of discontinuation were high (64%–98%) for all drugs in both cities.

### DISCUSSION

Proponents of criminalization attribute to their preferred drug-control regime a special power to affect user behavior. Our findings cast doubt on such attributions. Despite widespread lawful availability of cannabis in Amsterdam, there were no differences between the 2 cities in age at onset of use, age at first regular use, or age at the start of maximum use. Either availability in San Francisco is equivalent to that in Amsterdam despite policy differences, or availability per se does not strongly influence onset or other career phases.

We also found consistent similarities in patterns of career use across the different policy contexts. Although a few significant differences were found in some dimensions of use

during some career phases, the basic trajectory was the same in both cities on all dimensions of use: increasing use until a limited period of maximum use, followed by a sustained decrease in use over time or by cessation. It is significant, from a public health perspective, that clear majorities of experienced users in both cities never used daily or used large amounts even during their peak periods, and that use declined after those peak periods. Furthermore, both samples reported similar steady declines in degree and duration of intoxication. Only 6% in each city reported escalation of use over time.

We expected differences in drug policies to affect the duration of cannabis-use careers and the rates of cessation. Criminalization is designed to decrease availability, discourage use, and provide incentives to quit. Decriminalization is said to increase availability, encourage use, and provide disincentives to quit. Thus, we expected longer careers and fewer quitters in Amsterdam, but our findings did not support these expectations. Cannabis careers ranged from 1 to 38 years, and 95% of respondents in both cities reported careers of 3 years or longer. The mean career length was slightly greater in San Francisco (15 years) than in Amsterdam (12 years), but this finding was mostly because of the somewhat higher mean age in the San Francisco sample (34 years vs 31 years). Similarly, nearly identical proportions of respondents in each city had quit by the time they were interviewed—33.8% in Amsterdam and 34.3% in San Francisco.

If drug policies are a potent influence on user behavior, there should not be such



strong similarities across such different drug control regimes. Our findings do not support claims that criminalization reduces cannabis use and that decriminalization increases cannabis use. Moreover, Dutch decriminalization does not appear to be associated with greater use of other illicit drugs relative to drug use in San Francisco, nor does criminalization in San Francisco appear to be associated with less use of other illicit drugs relative to their use in Amsterdam. Indeed, to judge from the lifetime prevalence of other illicit drug use, the reverse may be the case.

Our study has limitations and should be replicated in other cities over longer periods. While our findings share the limitations of all self-report studies (e.g., vague or selective memory, over- or understatement of fact), we attempted to minimize these limitations by means of carefully worded questions, extensive pretesting, and use of multiple measures. The questionnaire is available under *questionnaire* at <http://www.cedro-uva.org/lib/cohen.canasd.html>. Our comparable samples and measures helped isolate the effects of drug policies, but “all else” is not necessarily “equal.” Cultural and social conditions in the United States are different from in the Netherlands; therefore, cannabis use might increase if the United States were to adopt a Dutch approach. Further studies that examine prevalence before and after policy shifts would be illuminating, although previous studies of the impact of marijuana decriminalization among 11 US states during the 1970s found no increases.<sup>33–36</sup>

One hypothesis for future research is that with a widely used drug like cannabis, the informal social controls that users develop as part of their culture<sup>30,31,37–39</sup> have more powerful regulatory effects on their behavior than do formal social controls such as drug policies. This possibility emerged from responses to questions about the circumstances respondents found appropriate for cannabis use. In both cities, relaxation was the most common purpose of use, and majorities from both cities reported that they typically used cannabis with friends and at social gatherings. Majorities in both cities most often mentioned work or study as situations in which use was inappropriate. In both cities, 69% reported negative emotional states as unsuitable for

cannabis use, and 80% reported having advised novices about the virtues of moderation.

## CONCLUSIONS

These data suggest that most experienced users organize their use according to their own subcultural etiquette—norms and rules about when, where, why, with whom, and how to use—and less to laws or policies. When experienced users abide by such etiquette, they appear to regulate their cannabis use so as to minimize the risk that it will interfere with normal social functioning. This pattern suggests that if formal drug policies are based on the folk (informal) drug policies users themselves already practice, drug policies may achieve greater relevance. ■

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This article was accepted June 7, 2003.

### Contributors

C. Reinerman assisted in conceiving the study and analyzing the data. H.L. Kaal composed the figures and the tables that form the core of the data analysis. P.D.A. Cohen proposed the study, led its conceptualization, designed and supervised the data analysis, and assisted with writing the article.

### Acknowledgments

The authors would like to acknowledge the generous financial support of the Dutch Ministry of Health and the US National Institute on Drug Abuse (grant 1 R01 DA10501–01A1), which made this research possible.

We thank Manja Abraham, Ira Glasser, Harry G. Levine, Marsha Rosenbaum, Arjan Sas, and 3 anonymous *American Journal of Public Health* reviewers for their helpful comments. An earlier version of this article was presented at the 97th Annual Meeting of the American Sociological Association, Chicago, Ill, August 15–19, 2002.

### Human Participant Protection

This protocol was approved by all relevant institutional review boards and funding agencies.

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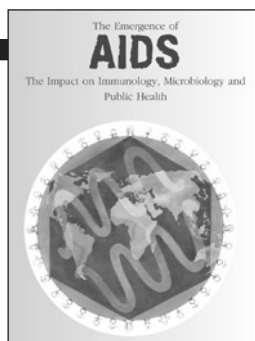
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