

**CRACK ABUSERS AND NONCRACK DRUG ABUSERS:  
A COMPARISON OF DRUG USE, DRUG SALES, AND NONDRUG CRIMINALITY**

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EXECUTIVE SUMMARY

The drug use patterns, drug selling behavior, and other crimes (robbery, burglary, theft, etc.) of crack abusers are systematically compared with those of heroin injectors, cocaine snorters, marijuana-only users, and nondrug users. Several striking differences in the frequency of crack use and crack dealing emerge among the various drug user types.

Since the emergence of crack abuse and widespread crack sales in 1985, little scientific data have been available to document whether and how crack abusers differ from noncrack drug abusers. This report addresses the following questions:

1. What are the drug consumption patterns of crack users and very frequent crack users?
2. What are the drug dealing and nondrug criminal patterns of crack users and very frequent crack users?
3. How different are the drug use/abuse, drug selling, and nondrug criminal patterns of crack abusers from those of noncrack drug abusers, especially heroin injectors, cocaine hydrochloride users (mainly "snorters"), marijuana-only users, and nondrug users.
4. Among subgroups of crack abusers, how much difference does frequency of crack use make in patterns of drug consumption, drug selling, and nondrug criminality?

RESEARCH METHODS

Over a thousand (N=1,003) persons were interviewed for one to two hours between August 1988 and July 1989. Subjects were selected from social settings and categories in which large numbers of crack and noncrack drug abusers could be conveniently recruited: 1) neighborhood streets in Northern Manhattan, 2)

arrested, but released persons, 3) jail, 4) prison, 5) probationers/parolees, and 6) drug treatment clients. Quotas were set to insure that approximately two-thirds of the subjects interviewed would be crack users and one-third would have used crack fewer than ten times, though they may have used other drugs on a regular basis.

Subjects in this study do not constitute a statistically representative sample of crack and noncrack drug abusers in Northern Manhattan. However, the findings reported below probably contains adequate numbers of persons who represent various subgroups of drug abusers, as well as their drug use, drug sales, and nondrug crime patterns.

#### THE DRUG USER HIERARCHY

Early in the interview, subjects were asked: During your lifetime, about how many times have you used (several substances/routes of administration)? Answers for four substances (crack, heroin injection, cocaine snorting, and marijuana use) were used to operationally define a seven-category Drug User Hierarchy: 1) nondrug users, 2) marijuana-only users, 3) cocaine snorters, 4) heroin plus low crack users, 5) heroin plus moderate crack users, 6) regular crack users (no heroin), and 7) heavy crack users (no heroin). Almost all of the heroin injectors (groups 4 and 5) were over age 30, while less than 30 percent of crack users were over age 30. This Drug User Hierarchy was related to several different dependent variables measuring drug use, drug sales, and nondrug criminality in the year 1988.

#### MAJOR FINDINGS

While many detailed and significant associations are contained in the report, some central conclusions emerge:

Crack vs. Noncrack Drug Abusers - III -

- . Crack abusers are using drugs at high rates, and with greater cash returns, than are those whose drug use is limited to heroin injection, cocaine snorting, or marijuana consumption, or who do not use drugs at all.
- . Crack abusers (who use crack over 100 times in a lifetime --groups 5, 6, 7) are significantly different from other drug user subgroups on many dimensions. They generally have the highest proportions involved in and receiving high incomes from drug sales and other criminality.
- . Among crack abusers, crack use greatly exceeds the cost and frequency of use of other specific drugs which they also consume.
- . Crack abusers have higher frequencies and cash incomes from other crimes (robbery, burglary, thefts, etc.) than cocaine powder users. Crack abusers and heroin injectors have similar and high frequencies and incomes from such other crimes.
- . By 1988, crack had become the most frequently sold and lucrative drug in the street drug market. Crack selling is the most frequent crime and generates the largest cash income for all illicit drug user subgroups studied.
- . Crack sales generate higher cash incomes than the sale of heroin, cocaine powder, marijuana, or the commission of other crimes (robbery, burglary, thefts, etc.).
- . The prototypical heroin addict who injects heroin and/or speedballs on a daily basis (and uses marijuana and alcohol on a regular basis), but who avoids or only experiments with crack (group 4), appears to be relatively uncommon among drug users in New York City in 1988. While such heroin abusers are most active in various forms of larceny, they also appear to engage in crack sales to support their heroin consumption.

These findings have important implications for policies directed towards drug abusers. First, social policy directed at controlling and limiting the selling activities of crack dealers may undermine the economic returns with which various drug (crack, heroin, cocaine, marijuana) users finance their drug use. Second, there is an urgent need for expansion of treatment slots for crack abusers, and for the development of new treatment methods specifically designed for them, (especially those not injecting heroin). Yet rarely is treatment available to the numerous crack abusers in this study. Third, continuing research is needed to document the career paths in drug use/sale and

nondrug criminality, and the changing patterns of drug abuse among the cohort of persons who became crack abusers in the late 1980s.

Future analyses of these data are planned and designed to address the extent to which criminal justice sanctions (arrest, probation, jail, prison) and voluntary treatment affected drug use, drug sale, and nondrug crime patterns among the various subgroups of substance abusers.

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I. BACKGROUND

During 1984 and 1985, members of the Street Studies Unit of the Division of Substance Abuse Services, working in the Bronx and northern Manhattan, began to encounter small vials containing what the dealers called "crack." Crack was determined to be derived from cocaine hydrochloride via the freebasing process. The freebased residue, after drying, was broken ("cracked") into small chunks and placed into vials originally designed for perfume samples.<sup>1</sup> Such cocaine freebase, packaged in easily concealed vials, was a boon to illegal drug sellers for three reasons: 1) The price per vial (\$3-\$25, average \$10) could vary dramatically depending upon the size of the vial and the size and number of "chunks" included; buyers with varying amounts of money could be provided with retail units they could afford. 2) Buyers could rapidly place vial contents in crack pipes, heat it, inhale the fumes, and obtain an instant "rush"; the need for another dosage reoccurred within half an hour. 3) The same customers repeatedly returned for drugs, so sellers had to reorganize their businesses to provide repeat customers with crack "24-7" (24 hours a day, seven days a week).

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<sup>1</sup>Brody (1985) first published a news article using the term "crack" for such vials of cocaine freebase. The name "crack" was widely adopted by national news magazines (Newsweek 1986abc, Time 1986), although the term "rock" had been used previously on the west coast (Klein, Moxen, Cunningham 1988). Several reports describe crack and its evolving history (Inciardi 1986; Hamid 1990; Johnson et al. 1990; Johnson, Hamid, Sanabria 1991; Fagan 1990).



After 1985, crack use and sales expanded dramatically in the New York Metropolitan area and in other cities. The public demanded stronger law enforcement, and the police and courts responded. Statistics released by criminal justice agencies began to reflect dramatic increases in: arrests for cocaine and crack possession and sales; rearrests among crack arrestees; convictions; length of jail and prison sentences; size of in jail, prison, and probation populations; and cocaine positive urine samples among arrestees.<sup>2</sup> Although drug treatment programs did not expand much after 1985, the primary drug of abuse among clients shifted from heroin to crack in most residential and outpatient drug-free programs. Even among methadone clients, crack abuse is now a prominent problem.<sup>3</sup>

Epidemiological studies of cocaine and crack in the general population, however, do not document extensive and widespread regular use of crack among either adults or adolescents.<sup>4</sup> A survey conducted in the spring of 1986 revealed that only one percent reported a lifetime use of crack (compared with 13 percent for cocaine) in New York City (Frank et al. 1988). Such epidemiological surveys, however, exclude approximately two percent of the population and miss those without a place of residence, or living in institutions such as jails and prisons. The U.S. Senate Committee on the Judiciary (1990) estimates that 2.2 million persons were hardcore cocaine addicts; 434,000 of

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<sup>2</sup>See Nickerson and Dynia (1988); Ross and Cohen (1988); Belenko, Fagan, Chin (1990); DUF (1990); Fagan (1990); Johnson et al. (1990); New York City Police Department (1990).

<sup>3</sup>Rainone et al. (1987); Frank et al. (1988); Ball et al. (1988); Magura et al. (1990); Wallace (1990); Wish & Gropper 1990.

<sup>4</sup>National Institute on Drug Abuse (1989); Johnston, O'Malley, Bachman (1990); Kandel (1990).

these are reported to reside in New York State, mainly in New York City. A sizable (but unknown proportion) of these are daily users of crack. Only about 10 percent of the cocaine abusers received treatment in the prior year in New York (Frank et al. 1988).

Central Questions: Other than the above data, and several articles appearing in 1990,<sup>5</sup> remarkably little scientific literature is available about crack users and their patterns of behavior. This report addresses issues and questions for which little or no data are currently available. Specifically:

1. What are the drug consumption patterns of crack users and very frequent crack users?
2. What are the drug dealing and nondrug criminal patterns of crack users and very frequent crack users?
3. How different are the drug use/abuse, drug selling, and nondrug criminal patterns of crack abusers from those of noncrack drug abusers, especially heroin injectors, cocaine hydrochloride users (mainly "snorters"), marijuana-only users, and nondrug users?
4. Among subgroups of crack abusers, how much difference does frequency of crack use make in patterns of drug consumption, drug selling, and nondrug criminality?

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<sup>5</sup>See articles in Fagan (1990) and De La Rosa, Lambert, Gropper (1991). Also see Belenko, Fagan, Chin (1990); Fagan, Chin (1990ab); Johnson et al. (1990); Johnson, Hamid, Sanabria (1991); Klein, Maxson, Cunningham (1988); Reuter et al. (1990).

To such questions, few answers currently exist. The data presented below constitute some early answers to these questions.

**Report Organization:** This report is designed primarily to describe<sup>6</sup> the behavioral patterns of various types of drug users. Section II describes the research methods employed and the characteristics of subjects. Section III delineates a Drug User Hierarchy which operationally defines seven different subgroups of drug users (the independent variable) and describes the characteristics of persons classified into those categories. Section IV summarizes statistically significant associations and bivariate comparisons between the Drug User Hierarchy and (A) Current Drug Use Patterns, (B) Current Drug Sale Patterns, and (C) Current Involvements in Nondrug Criminality. Part D summarizes the complex behavioral patterns of persons classified into each drug user subtype. the concluding section provides some implications which emerge from the data in this report.

## II. RESEARCH METHODS

The research methods are explained more fully in Appendix A and are briefly summarized here. Over a thousand (N=1003) persons were interviewed for 1-2 hours between August 1988 and July 1989.

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<sup>6</sup>While this is a descriptive report, anticipated funding by the National Institute on Drug Abuse (Johnson and Fagan 1989) will support the analysis and publication of additional reports focusing upon many relevant questions raised by the data in this report.

Since there exists no technique to sample crack and drug abusers with a known probability, subjects were selected from social settings where large numbers of crack and noncrack drug abusers could be conveniently recruited. Subjects were recruited from six theoretically important social settings or categories: 1) neighborhood streets, 2) arrested, but released persons, 3) jail, 4) prison, 5) probationers/parolees, and 6) drug treatment clients. Investigators set quotas so that approximately two-thirds of the subjects interviewed would be crack users and the other third, though they may have used other drugs on a regular basis, would never have used crack, or would have used it fewer than ten times.

The major variable, clearly built into the screening and selection process, was a hierarchy concerning degree of involvement with drug. Staff undertook efforts to locate sizable subsamples of persons who were: 1) crack users/abusers with little or no heroin injection history; 2) crack users/abusers with significant heroin injection histories; 3) cocaine users who snorted or injected cocaine, but who had no or little or no experience with crack or heroin injection; 4) marijuana-only users with no use of cocaine, heroin, or crack; 5) nondrug users recruited from the same neighborhoods as drug-abusing subjects.

Subjects who met the screening criteria were interviewed for one to two hours about several topics, of which three are the focus (and dependent variables) of this report. These include measures of (1) drug use patterns, (2) drug distribution, and (3) nondrug criminality.

Table 1. Demographic and Social Characteristics of Subjects in the Crack-Crime Study.

Demographic/Social Characteristic  (Base N)	This Study		Manhattan 1989 Felony Arrestees <sup>a</sup> (2,901)
	Number of Subjects (1,003)	Percent- age (100)	
<b>Sex</b>			
Male	692	69%	89%
Female	311	31	11
<b>Ethnicity</b>			
Black	639	64	55
Hispanic	289	29	35
White	74	7	10
<b>Age</b>			
under 22	227	22	29
22-29	364	37	37
Above 30-39	314	31	26
40 & Older	95	10	10
Mean Age	28		
<b>Employment Status</b>			
Fulltime job	157	16	11
Parttime	95	10	27
Unemployed	747	74	62
<b>Marital Status</b>			
Single/never married	648	65	NA
Currently married/ common law	196	19	NA
Separated & other	158	16	NA
<b>Year Reaching Young Adulthood (age 18)</b>			
1949-64 Early heroin	59	6	6
1965-73 Mainly heroin	230	23	15
1974-80 Cocaine powder	299	30	28
1981-84 Freebase	179	18	19
1985-90 Crack	234	23	32
<b>Recruited from:</b>			
Streets	408	41	NR
Arrested, Released	132	13	NR
Jail	101	10	NR
Prison	135	13	NR
Probation/Parole	78	8	NR
Treatment Program	149	15	NR

<sup>a</sup>Data from a random sample of felony arrestees in Manhattan 1989 (Belenko 1990).

NA -- Not available

NR - Not relevant

### Characteristics of Subjects

Table 1 shows the demographic characteristics of the 1,003 subjects who provided usable data upon which the analyses are based. Approximately two-thirds are male and one third are female. About 60 percent are black, 30 percent Hispanic, and less than 10 percent white. Sixty percent are under age 30, but the mean age of all subjects is 28. Three quarters report being unemployed, and only 16 percent had a full-time job.

The years in which subjects reached young adulthood (age 18) will be subsequently shown to have importance in terms of the primary drugs of abuse (Johnson et al. 1990). About 30 percent reached young adulthood before 1974, when heroin was the primary hard drug available in New York City. Almost half of the subjects reached young adulthood as cocaine powder began to dominate the streets (1965-84), while almost a quarter reached young adulthood in the last half of the 1980s when crack was widely available. About a third had an unstable living situation (20 percent lived alone and/or in "other" settings, such as shelters, welfare hotels, outdoors--data not presented). The remainder lived with family members (about a quarter still lived with their parents).

These characteristics are similar to distributions encountered in criminal justice populations and treatment populations in Manhattan. The characteristics of felony arrestees in Manhattan in 1989 (Belenko 1990) are provided in the third column. Only 11 percent of felony arrestees are female; yet close to a third of treatment clients are female (Rainone et 1987). Since most of this study's neighborhood samples were collected in Northern Manhattan, the proportions of Hispanics and whites are slightly lower than among Manhattan felony arrestees.

Likewise, a slightly higher proportion of Manhattan arrestees are age 21 or younger as compared with our sample. A quarter of this study's subjects claim full or part-time employment, in contrast to three-eighths of Manhattan arrestees who claim employment, among whom only 11 percent have verified employment.

At the bottom of Table 1, the social context of recruitment is provided. Two-fifths were recruited from the streets and were not known to be involved with the criminal justice system at the time of their interview. They represent drug users "at liberty" with little or no criminal justice contact. Fifteen percent were recruited from drug treatment settings, 23 percent were incarcerated in jail or prison, and 21 percent had very recent arrests or incarcerations, or were on probation or parole, but were at liberty when interviewed.

While the sampling procedures did not use probability sampling, the use of quotas to insure sufficient sample sizes from various social contexts provided distributions that do not differ substantially from felony arrestees or treatment populations. Thus, while the subjects in this study do not constitute a statistically representative sample of crack and noncrack drug abusers in Northern Manhattan, the findings reported below probably represent adequate numbers of persons from various subgroups of drug abusers, as well as an adequate picture of their drug use, drug sale, and nondrug crime patterns. In the following section, a hierarchy of drug abuse patterns is created. This hierarchy is employed in the analyses that follow.

**DEVELOPMENT OF DRUG USER SUBGROUPS**

In this section, the rationale for developing drug user subgroups is given. The derivation and description of a drug user hierarchy, which will be the major independent variable in subsequent analyses, is provided.

The subjects in this study were selected to represent specific subgroups of drug users and abusers. Persons were selected to represent subgroups of users previously identified in the literature: a) nondrug users, b) marijuana-only users, c) cocaine snorters, d) heroin injectors, and e) crack users. With the exception of groups a and b, almost all users consume a variety of drugs. First, efforts were made to identify persons who were "primarily crack abusers." Most of these have substantial histories of cocaine snorting, but without significant heroin injection activity. Second, the study identified "heroin plus crack users" who had substantial histories of heroin injection (almost all had used crack on a moderate to regular basis; few had avoided crack entirely). Third, the study sought persons who were primarily "cocaine snorters;" they had little or no heroin injection and limited crack use. Fourth, persons who reported using "only marijuana," or who were nondrug users, were also recruited from street settings. A few persons interviewed in prisons/jails reported drug-selling activity but claimed to be marijuana-only users or nondrug users. The classification of persons according to their reports on "lifetime use" questions (asked early in the interview) may not provide an accurate portrait of their behavior for specific years (which was discussed later in the interview). Thus, a few persons classified as "marijuana users" or "nondrug users" may report some crack, cocaine, or marijuana use.



Because the number of subjects is sufficiently large, distinctions can be made between moderate and high lifetime frequency of crack use, both among those who are "primarily crack abusers" and those who are "heroin plus crack users." Perhaps the frequency of use is more important than the type of drug used, at least among the heaviest drug users. Finally, a few subjects were recruited and interviewed because they were primarily marijuana-only users, or nonusers of illicit drugs. The latter subgroups are the most numerous in the general population and among young adults (NIDA 1989; Frank et al. 1988).

#### Defining Subgroups of Drug Users/Abusers

Early in the interview, subjects were asked, "During your lifetime, about how many times have you used (several substances and routes of administration)?" Answers were precoded into eight categories.<sup>7</sup> Only four drug use items, however, were used to operationally define the drug user subgroups: crack use, heroin injection, cocaine snorting, and marijuana use. The lifetime frequencies of use of these four drugs are provided in Table 2.

Some lifetime use was reported by most of these subjects. Three-quarters had used crack, 80 percent had snorted cocaine, and 90 percent had used marijuana. Only about a third had tried heroin injection. Almost half had used marijuana over 1,000 times, while about 20 percent reported such high frequencies of crack use, heroin injecting, and cocaine snorting. The distributions varied for these substances. Half had used crack

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<sup>7</sup>The number of times: never, 1-2, 3-9, 10-49, 50-99, 100-999, 1000-9999, 10,000 and over; these categories approximate the distribution of a  $\log_{10}$  transformation to control for extremely high scores by a few persons.

100 or more times. Relatively few heroin users had injected heroin less than 1000 times. Cocaine snorting was quite evenly distributed across all use levels.

Because polydrug use was anticipated to be very common, a four-way crosstabulation of these variables was closely examined.<sup>8</sup> Every cell was classified into one drug user subgroup using the technique of reduction of property space (Barton 1955) to develop the "Drug User Hierarchy." Figure 1 helps to conceptualize how respondents were classified into each of the categories of the drug user hierarchy. Table 3 provides a short label, the operational definition of each category, and the number and percent of subjects so classified.

This shows that crack users (groups 4-7) constitute 65 percent of the subjects, and cocaine snorters (several have limited crack use) another 16 percent. The crack users are split into those who are primarily crack abusers (39 percent) and those who are heroin injectors plus crack users (26 percent). Both of these groups are divided into similar sized groups according to their frequency of crack use. Due to our subject recruitment strategy, relatively few marijuana-only users (13 percent) and nondrug users (6 percent) were included.

While the term hierarchy is used here, this term does not

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<sup>8</sup>Cluster analysis techniques were not used for the development of this hierarchy because fewer variables than categories were sought. Moreover, such cluster techniques may determine that several groups go together, and we wanted to keep them separate here. For the purposes of analysis, however, maintaining a sharp distinction between crack abusers (who may also have very high levels of cocaine snorting) and cocaine snorters (with low levels of crack use) was an important feature for showing whether and to what degree crack abuse influences drug distribution activity and nondrug criminality.

imply ordinal or linear arrangements of groups;<sup>9</sup> these are nominal categories. There is no theoretical or logical reason why heavy crack users (group 7) should be higher on a specific dependent variable than moderate crack users (group 6) or than heroin plus moderate crack users (group 5). While it is likely that group 7 should have more involvement than group 6, the same may not be true for group 5, or even for groups 2 or 1.

For each drug user subgroup (except the nondrug users), over 120 subjects are available for analysis. This means that relatively small differences may reach statistical significance. One statistic is employed to reject null hypotheses. Cramer's V provides a measure of association which is similar to the Pearson correlation coefficient, but it is used when categories are nominal (rather than interval). A Cramer's V value of under .10 usually indicates a very modest association, even if it reaches statistical significance.

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<sup>9</sup>Each drug user subgroup is nominal and defined by criteria which assured sufficient cases for subsequent analysis. Because subjects were not recruited from a known population, and because staff made special efforts to locate and recruit persons at the "right tail" of drug user subgroups, most assumptions of normality in statistical testing theory cannot be true. Thus, the statistical tests employed below are designed to suggest where differences are most likely.

Table 2. Lifetime Frequencies of Drug Use for Specific Drugs Used.

Drugs	Lifetime Frequency of Drug Use					Total (N=1,003)
	Never	1-9 times	10-99 times	100-999 times	1000 & + times	
Crack	25	8	15	35	17	100
Heroin (inject)	71	3	3	5	18	100
Cocaine (snort)	19	14	24	22	21	100
Marijuana	10	8	16	19	47	100

FIGURE 1

DIAGRAM CLASSIFYING SUBJECTS INTO DRUG USER HIERARCHY

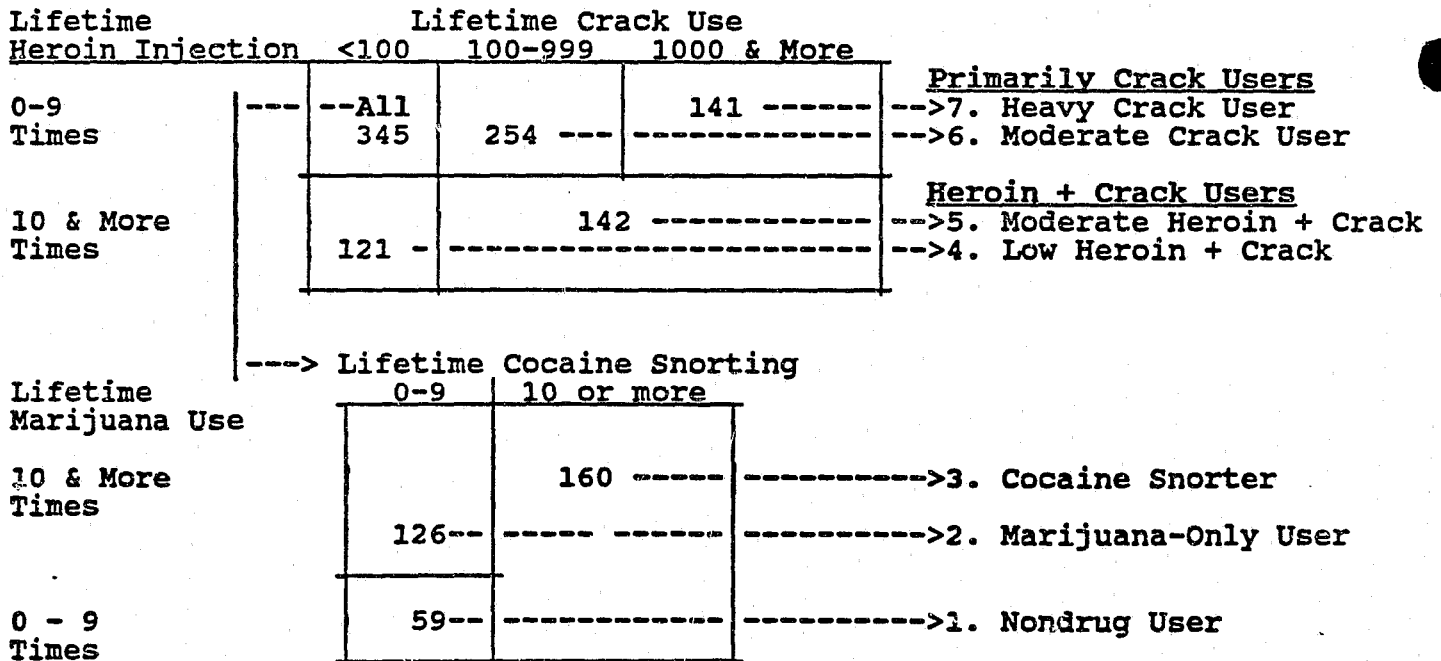


Table 3. Lifetime Drug User Hierarchy

Category in Lifetime Drug User Hierarchy	Operational Definition of Category	Number of Subjects	Percent in Category
<u>Primarily Crack Users</u>			
7. Heavy Crack Users	Crack used over 1000 times in lifetime; typically snorted cocaine and used marijuana; used heroin fewer than 10 times.	141	14
6. Moderate Crack Users	Crack used 100-999 times in lifetime; typically snorted cocaine and used marijuana; used heroin fewer than 10 times.	254	25
<u>Heroin + Crack Users</u>			
5. Heroin Injectors + Moderate Crack	Injected heroin over 9 times, and used crack over 100 times; typically used cocaine powder and marijuana regularly.	142	14
4. Heroin Injectors + Low Crack	Injected heroin over 9 times, and used crack under 100 times; typically used cocaine powder and marijuana regularly.	121	12
3. Cocaine Snorters	Snorted cocaine more than 9 times but used crack fewer than 100 times, or injected heroin fewer than 10 times; typically used marijuana, sometimes pills.	160	16
2. Marijuana-Only Users	Used marijuana more than 9 times, but used crack, snorted cocaine, and injected heroin fewer than 10 times; may use pills, psychedelics, PCP on an irregular basis.	126	13
1. Nondrug Users	Typically reported no lifetime use of any illicit drug; a few subjects may have used marijuana fewer than 10 times.	59	6
<b>Totals</b>		<u>1,003</u>	<u>100</u>

Table 4. Lifetime and Regular Use of Various Drugs by Lifetime Drug User Hierarchy

Drugs	Group	1	2	3	4	5	6	7	Cram- er's V
	(Base N)	(59)	(126)	(160)	(121)	(142)	(254)	(141)	
		<u>Lifetime Drug User Hierarchy</u>							
		Nondrug Users	Mari- juana users	Cocaine Snorters	Heroin +Crack <100	Heroin +Crack 100+	Crack Users Reg Heavy Total		

## Percent with any lifetime use of:

Crack	27	29	52	66	100*	100*	100*	75	.664
Cocaine freebase	14	11	41	34	80	65	72	51	.339
Cocaine (snort)	29	48	100*	84	87	87	88	80	.349
Cocaine (inject- not w/heroin)	7	3	8	88	87	5	6	27	.810
Speedball*	9	3	23	90	94	9	14	33	.759
Heroin (inject)	3	0	7	100*	100*	2	4	29	.667
Heroin (snort)	3	15	44	84	83	31	41	45	.513
Illicit Methadone	3	1	18	73	69	7	8	25	.472
Marijuana	51	100*	96	88	86	93	93	90	.264
PCP (Angel Dust)	12	18	29	26	41	39	51	34	.238
Psychedelics	10	9	24	34	45	32	39	30	.252
"Ups"	7	7	16	31	35	19	22	20	.219
"Downs"	5	7	17	44	49	21	16	24	.341
Alcohol	53	71	80	68	74	80	82	75	.148

## Percent using 100 or more times in lifetime via:

Crack	0*	0*	0*	0*	100*	100*	100*	54	.740
Cocaine freebase	2	1	10	7	46	26	48	23	.377
Cocaine (snort)	0*	0*	59	46	59	47	56	43	.389
Cocaine (inject- not w/heroin)	2	2	3	24	23	4	4	8	.576
Speedball*	3	1	11	66	75	4	3	22	.561
Heroin (inject)	0*	0*	0*	83	89	0*	0*	23	.684
Heroin (snort)	3	10	25	47	35	21	35	26	.90
Illicit Methadone	2	0	1	26	32	1	1	8	.472
Marijuana	0*	70	69	60	63	74	81	66	.310
PCP (Angel Dust)	10	15	23	22	32	30	36	26	.174
Psychedelics	0	1	1	5	9	4	6	4	.186
"Ups"	0	0	2	11	10	2	4	4	.181
"Downs"	0	1	4	17	23	2	3	7	.275
Alcohol	12	36	42	50	58	50	55	46	.186

\* Inject cocaine plus heroin in same mixture.

0\* Zero by definition of category.

100\* One hundred percent by definition of category.

### Lifetime Patterns of Drug Use

The value of the Drug User Hierarchy can be demonstrated by showing how strongly it is associated with the use of other drugs and other routes of administration that were not used to define this hierarchy. Subjects were asked to report their lifetime use of various drugs, as well as several routes of administration for heroin and cocaine. Table 4 shows "any lifetime use" and "100 or more lifetime uses" for 13 drugs/routes of administration.

About 90 percent of heroin injectors (groups 4 and 5) also had lifetime involvement with injecting cocaine and speedballing, while less than a quarter of each of the other drug user subgroups did so. Moreover, among heroin injectors, over half have speedballed 100 or more times, but only a third have injected cocaine without heroin. Less than 3 percent of other subgroups have injected cocaine or speedballed over 100 times. Heroin injectors were also twice as likely to have snorted heroin as were members of other subgroups; about a fifth had snorted heroin 100 or more times.

In a similar fashion, crack abusers were the most likely to have freebased cocaine; about a fifth of the heavy crack users and heroin plus moderate crack users had freebased 100 or more times. Almost 90 percent of crack users report experience snorting cocaine, and a third report doing so 100 or more times. Cocaine snorters and crack abusers who are not heroin injectors rarely report cocaine injection or speedballing.

Virtually all drug users report use of marijuana and alcohol during their lifetime, but only about half of drug user subgroups report 100 or more uses of marijuana, and about a third report 100 or more uses of alcohol. Use of PCP, psychedelics, ups, and

Table 5. Demographic Characteristics of Persons Classified in Drug User Hierarchy

Group	1	2	3	4	5	6	7	Total	Cramer's V
	Lifetime Drug User Hierarchy								
Demographic Characteristic (Base N)	Nondrug User (59)	Mari- juana users (126)	Cocaine Snorter (160)	Heroin+Crack Users <100 (121)	100+ (142)	Crack Users Reg Heavy		(1003)	
						(254)	(141)		
<b>Sex</b>									
Male	54	68	69	79	73	66	70	69	.117
Female	46	33	31	22	27	34	31	31	
<b>Ethnicity</b>									
Black	60	71	54	51	61	69	75	64	.160
Hispanic	33	21	39	33	25	29	22	29	
White	7	7	7	16	13	3	4	7	
<b>Age</b>									
under 22	39	38	26	6	2	29	22	23	
22-29	34	44	44	12	16	45	49	36	.371
30 and older	27	18	29	83	82	26	30	41	
<b>Employment Status</b>									
Legal job	48	42	40	18	10	18	18	25	.289
Unemployed	53	58	60	82	90	82	82	75	
<b>Marital Status</b>									
Never married	75	74	63	47	48	73	72	65	
Married/ common law	10	21	22	23	23	15	20	20	.192
Separated/ other	15	5	15	30	29	12	9	16	
<b>Year Reaching Young Adulthood (age 18)</b>									
1949-64	2	2	4	19	14	2	2	6	
1965-73	19	10	14	51	54	11	12	23	
1974-80	17	25	33	21	24	35	42	30	.287
1981-84	24	24	21	5	7	23	19	18	
1985-90	39	40	29	4	1	30	24	23	
<b>Education</b>									
Less than 12	39	49	43	48	44	55	51	48	
12 or GED	46	40	39	28	31	34	31	35	.121
Over 12	15	11	19	24	25	12	18	17	



downs is most common among heroin injectors; generally under 10 percent of all user subgroups have used these substances 100 or more times.

Overall, these data document sharp differences among the various subgroups in drug use and regular drug use during their lifetime. Thus, the drug user hierarchy provides strong associations with other drugs/routes of administration, and in the directions that would be expected from current understandings of specific patterns of drug abuse.

#### Demographic Characteristics of Subgroups in Drug Hierarchy

The demographic characteristics of persons in each drug user subgroup are provided in Table 5. While sex, ethnicity, marital status, and education are significantly ( $p < .001$ ) related to the drug hierarchy, the strength of these associations is modest (Cramer's  $V$  between .10 and .19). Heroin plus crack users (groups 4 and 5) have somewhat higher proportions of males, whites, unemployed persons, and persons with post high school education when compared with crack users (groups 6 and 7) and less serious users (groups 1-3). Higher proportions (over 40 percent) of the cocaine powder, marijuana, and nondrug users report a legal job as compared with the heroin and crack abusers (under 20 percent).

The most interesting findings are the strong associations (Cramer's  $V$  over .28) of age and year reaching young adulthood with categories in the drug user hierarchy. Four-fifths of heroin plus crack users (groups 4 and 5) are age 30 and older, while about a quarter of the other subgroups are above age 30. Very few (less than 6 percent) heroin plus crack users were young (under 22). The highest proportion (38-39 percent) of young persons occurred among nondrug and marijuana users (group 1).

Substantial differences occur in the years at which these subgroups reached young adulthood (age 18). Two thirds of the heroin plus crack users reached adulthood by 1973, as compared with less than 16 percent of the crack abusers (groups 6 and 7) and marijuana or cocaine powder users (groups 2 and 3). Likewise, less than 10 percent of the heroin plus crack users reached young adulthood in the 1980s, while half to two-thirds of all other subgroups did so. These data imply important generational differences in patterns of drug initiation and in maintenance of drug abuse patterns. These issues will be analyzed in future reports.

In the following sections, the major findings about current patterns of drug use, drug sales, and nondrug criminality are provided.

## MAJOR FINDINGS

The central purpose of this report is to document the specific patterns of drug use, drug sales/distribution, and nondrug criminality of various subgroups of drug users in the year 1988. This year was chosen because it was the last year for which all subjects provided data, and it gave maximum opportunity for persons to have initiated use of crack and to have become regular users of the drug. Two sets of statistical data document differences between specific subgroups in the drug user hierarchy. Cramer's V (see Appendix A) provides an overall measure of association for nominal variables. Chi Square tests document significant differences for seven bivariate comparisons of greatest theoretical interest in Tables 6-12 as follows:

A--Overall association (Cramer's V) significant at  $p < .001$  level.

Bivariate comparison significant at  $p < .05$  level:

B--Heroin injectors vs. primary crack abusers (groups 4+5 vs. 6+7).

C--Cocaine snorters (3+4) vs. crack abusers (5+6+7).

D--Among primary crack abusers, moderate (6) vs. heavy (7) users.

E--Among heroin injectors, low crack (4) vs. moderate crack users (5).

F--Marijuana-only users (2) vs. cocaine snorters (3).

G--Nondrug users (1) vs. marijuana-only users (2).

H--Nondrug users (1) vs. cocaine snorters (3).<sup>10</sup>

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<sup>10</sup>The many other possible bivariate comparisons (e.g., marijuana-only users vs. primary crack users) are likely to be significant if the overall association is significant. Typically, a 10 percent difference between two groups would be significant at the .05 level.

Only persons in the specific subgroups were included in the bivariate comparisons; all others were set to missing. An example illustrates how to read the tabular data. To determine whether heroin users are more or less likely than crack users (comparison B) to be frequent users of cocaine powder (dependent variable), persons who injected heroin were summed (groups 4&5=121+142=263); likewise persons using crack but not heroin were summed (groups 6&7=254+414=386). The remaining subjects (groups 1-3) were set to missing and excluded from this statistical computation. This two-category variable, "heroin" versus "crack" users, was crosstabulated with the dependent variable (e.g., frequency of cocaine powder use); if the p value of chi-square was less than .05, the bivariate comparison was classified as significant.

The far right column of the third section of Table 6 lists "B" as one of several significant bivariate comparisons. In order to help the reader visualize the significant comparisons, symbolic lines are provided: | + ---- + B + --- + | indicates a significant "B" comparison between the sum of groups 4 and 5 and the sum of groups 6 and 7. The "+" symbols indicate which columns are summed into categories, while the location of the letter symbol ("B") shows where the break occurs. Thus, the "C" symbol shows that columns 3 and 4 (cocaine powder users) are contrasted with columns 5,6, and 7 (crack users-100 or more times).

The Drug User Hierarchy (as independent variable) is related to several specific measures (as dependent variables) of: A) current (1988) drug use patterns, B) drug sales patterns, C) nondrug criminal patterns. In the following sections of this report, data are presented separately for measures of frequency

Table 6. 1988 Annual Frequency of Specific Drugs Used By Lifetime Drug User Hierarchy

In 1988, the annual frequency of use for: (Base N)	Lifetime Drug User Hierarchy							Total	Cramer's V Sign.
	1 Nondrug users (59)	2 Marijuana users (126)	3 Cocaine Snorter (160)	4 Heroin <100 (121)	5 Heroin >100 (142)	6 Crack Reg (254)	7 Crack Heavy (141)		
<b>Crack</b>									
None	81	79	69	56	11	13	14	39	.355 ABCDEF
<Monthly	7	4	6	12	1	3	1	5	
<Daily	9	13	16	16	23	26	11	18	
1-3/Daily	0	5	4	12	23	28	20	16	
4 & + Daily	3	0	4	4	43	30	54	23	
				+ ----- + C					
<b>Heroin Injection</b>									
None	95	93	76	32	48	88	84	74	.295 ABC EF H
<Monthly	0	2	5	8	9	3	7	5	
<Daily	3	3	13	20	17	5	3	9	
1 & + Daily	2	2	6	40	26	4	6	12	
				+ ----- + C					
<b>Cocaine Powder</b>									
None	86	85	38	20	26	48	47	47	.273 ABCD FGH
<Monthly	2	11	11	10	13	14	14	12	
<Daily	9	2	33	27	33	24	16	22	
Daily	3	2	18	43	28	12	24	19	
				+ ----- + C					
<b>Marijuana</b>									
None	90	33	43	48	42	33	34	41	.176 ABC GH
<Monthly	5	13	11	17	16	12	11	12	
<Daily	3	33	23	21	27	31	23	25	
Daily	2	21	24	15	16	24	33	21	
				+ ----- + C					
<b>Alcohol</b>									
None	84	51	46	50	39	37	34	44	.199 ABCD FGH
<Monthly	7	21	14	9	10	14	16	14	
<Daily	7	25	29	17	21	29	16	23	
Daily	2	3	11	24	30	21	35	19	
				+ ----- + C					

\* Lines summarize the following significant bivariate comparisons:  
 A--Overall association (p<.0001). Following significant at p<.05:  
 B--(4+5 vs. 6+7); C--(3+4 vs. 5+6+7); D--(6 vs. 7); E--(4 vs. 5);  
 F--(2 vs. 3); G--(1 vs. 2); H--(1 vs. 3).

of involvements and the dollar amounts expended or earned from such involvements (in drug use, drug sales, and nondrug criminality).

#### A. CURRENT (1988) DRUG USE PATTERNS

##### 1. Frequency of specific drugs used in 1988

The Drug User Hierarchy is significantly associated with the frequency of use of all five drugs shown in Table 6. This association is strongest for crack, heroin, and cocaine powder, and more modest for marijuana and alcohol.

**CRACK.** Subjects classified as primarily crack abusers (groups 6 and 7) have higher 1988 frequencies of crack use than do heroin injectors (groups 4 and 5). Likewise, those who report 100 or more lifetime uses of crack (groups 5, 6, and 7) report higher 1988 frequencies of crack use than do cocaine snorters and heroin injectors with less than 100 lifetime uses of crack (groups 3 and 4). Within each of these groups, those who report 1,000 or more "lifetime" uses of crack (group 7) were significantly more likely (54 percent) to use crack 4 or more times daily in 1988 than were those reporting moderate (100 to 999--group 6) "lifetime" uses of crack (30 percent). Those classified as cocaine snorters (group 3) were more likely to use crack in 1988 than were marijuana users (group 2). In short, the drug user hierarchy (based only upon self reports of "lifetime" use of four drugs), provides meaningful distinctions that are meaningfully related to subject's consumption of crack in 1988.

**HEROIN.** Only groups with "lifetime" heroin injection experience (4 and 5) are likely to use heroin on a very regular basis in 1988. Heroin injectors with low crack use (group 4) have the highest proportion (40 percent) of 1988 daily heroin injectors, significantly higher (26 percent) than among those reporting heroin plus moderate crack use (group 5), and much higher than among those in other drug user subgroups (under 7 percent). Likewise, cocaine snorters (groups 3 and 4) are more likely to inject heroin than are persons with moderate/heavy crack use (groups 5, 6, and 7), or persons who use only marijuana (group 2).<sup>11</sup> Thus, among persons with a substantial history of heroin injection, those with moderate/heavy crack use appear to have lower proportions with

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<sup>11</sup>A variety of important questions about age at initiation of drug use, order of onset in the use of specific drugs, and regular use of these hard drugs, as well as "substitution or addition" of crack in relation to existing heroin patterns, will be undertaken in subsequent reports.

daily heroin injection in 1988 than do those who report less than 100 lifetime uses of crack.

**COCAINE POWDER.** The use of cocaine powder in 1988 is widespread among all groups, with the exception of marijuana and nondrug users (by definition), but considerable variation exists in the proportions using cocaine powder on a daily basis. The subgroups (4 and 5) that also inject heroin have the highest proportions of 1988 daily cocaine powder consumption (probably due to its use in "speedballs") when compared with primarily crack users (groups 6 and 7) or cocaine snorters (group 3), or with marijuana/nondrug users (groups 1 and 2). Among primarily crack abusers in 1988, heavy crack users (group 7) were more likely than regular crack abusers (group 6) also to be daily users of cocaine powder.

**MARIJUANA.** In 1988, those who are primarily crack abusers (groups 6 and 7) have higher proportions than do heroin plus crack users (groups 4 and 5) of persons with "any" and "daily" marijuana use. The proportions are similar, however, to those of marijuana-only users and cocaine snorters (groups 2 and 3). Nondrug users have very low levels of marijuana use, by definition.

**ALCOHOL.** While 1988 alcohol use is common among all drug user subgroups, its daily use in 1988 is significantly more likely in certain subgroups. Those who are primarily crack abusers (groups 6 and 7) have higher proportions with "any" and "daily" alcohol use in 1988 than do heroin plus crack users (groups 4 and 5), or than cocaine snorters or marijuana users (groups 2 and 3). Even though alcohol was not used to define the "nondrug user" category, such nondrug users have much lower proportions with "any" and "daily" alcohol use in 1988 than do all other subgroups.

## 2. Monthly expenditures for specific drugs in 1988.

Table 7 displays information about how much each subgroup of drug users spent per month for the drugs they consumed in 1988.

In choosing cut-off points, efforts were made to insure that approximately half of those with expenditures for drugs were classified into a lower and higher category.

**CRACK.** Very substantial differences in 1988 expenditures for crack occur among crack user subgroups. Those reporting over 100 "lifetime" uses of crack (groups 5, 6, and 7) have much higher proportions with "any" and "very high" (over \$1000 per month) crack expenses in 1988 than do cocaine snorters (groups 3 and 4). Even among those who are primarily crack abusers, heavy crack users (group 7) have higher proportions spending over \$1000 per month than do regular crack users (groups 5 and 6). Likewise, among heroin plus crack users, the regular

Table 7. 1988 Monthly Dollar Value of Various Drugs Consumed by Lifetime Drug User Hierarchy

In 1988, \$\$ expended per month for:	Lifetime Drug User Hierarchy							Total (1003)	Cram- er's V Sign.
	Group 1 Nondrug User (Base (59)	2 Mari- juana users (126)	3 Cocaine Snorter (160)	4 Heroin +Crack <100 (121)	5 Heroin +Crack 100+ (142)	6 Crack Reg (254)	7 Crack Heavy (141)		
<b>Crack</b>				*	+ --- +	B	+ --- +		.387 ABCDE
None	85	79	73	62	11	17	14	41	
<\$101	9	11	14	18	13	16	10	14	
\$101-1000	3	8	10	16	34	30	21	20	
>\$1000	3	2	3	4	42	37	55	25	
				+ ----- +	C	+ ----- +	--- +		
<b>Heroin Injection</b>					+ --- +	B	+ --- +		.358 ABC EF H
None	95	93	77	32	49	89	86	75	
<\$501	3	5	14	31	18	7	7	12	
>\$500	2	2	9	37	33	4	7	13	
				+ ----- +	C	+ ----- +	--- +		
<b>Cocaine Powder</b>					+ --- +	B	+ --- +		.307 AB F H
None	86	87	44	22	30	54	50	51	
<\$501	9	12	32	34	31	30	31	27	
>\$500	5	1	24	44	39	16	19	22	
				+ ----- +	C	+ ----- +	--- +		
<b>Marijuana</b>					+ --- +	B	+ --- +		.182 ABC FGH
None	91	37	49	54	46	43	38	47	
<\$51	5	28	24	27	30	27	28	26	
>\$50	3	35	27	18	24	30	34	27	
	--- G ---			+ ----- +	C	+ ----- +	--- +		
<b>Alcohol</b>					+ --- +	B	+ --- +		.202 A C FGH
None	86	55	50	49	42	42	35	47	
<\$51	10	37	35	27	28	33	30	31	
>\$50	3	8	15	24	30	25	35	22	
	--- G ---			+ ----- +	C	+ ----- +	--- +		

\* Lines summarize the following significant bivariate comparisons:  
A--Overall association (p<.0001). Significant at p<.05:  
B--(4+5 vs. 6+7); C--(3+4 vs.5+6+7); D--(6 vs. 7); E--(4 vs. 5);  
F--(2 vs. 3); G--(1 vs. 2); H--(1 vs. 3).



crack users (group 5) have much higher proportions with "any" and "very high" expenditures on crack in 1988 than do heroin users with low crack use (group 4).

**HEROIN.** Not surprisingly, "any" and substantial expenditures for heroin in 1988 occur mainly among the heroin plus crack user subgroups (groups 4 and 5), but are very low among crack abusers, cocaine snorters, and marijuana users (groups 2, 3, 6, and 7). Heroin injectors with low crack use (group 4) have higher proportions (31 percent) spending under \$501 per month in 1988 than do the heroin users who regularly use crack (18 percent--group 5). Both groups have similar proportions (one third) spending over \$500 monthly in 1988. Cocaine snorters (group 3) had lower 1988 expenditures for heroin than did heroin injectors (groups 4 and 5), but substantially higher heroin expenditures than did nondrug users and marijuana-only users (groups 1 and 2).

**COCAINE POWDER.** In 1988, persons in the heroin plus crack category (groups 4 and 5) had the highest proportions with "any" and "high" expenditures for cocaine powder. Their monthly expenditures for cocaine powder were higher than among primarily crack abusers and even than among cocaine snorters (group 3). Expenses for cocaine powder were much lower among marijuana (group 2) and nondrug users (group 1). Among heroin users (groups 4 and 5), expenditures for cocaine powder did not differ significantly between those with low crack use (group 4) and those with regular crack use (group 5).

**MARIJUANA.** While persons classified as "marijuana-only users" had the highest proportions with "any" and "over \$50/month" expenditures for marijuana, other subgroups also had substantial marijuana expenses. The heroin plus crack users (groups 4 and 5) had the lowest marijuana expenditures. Those who were primarily crack abusers (groups 6 and 7) had very similar 1988 marijuana expenditures to those of the marijuana-only group. Cocaine snorters (group 3) had significantly lower 1988 marijuana expenditures than did marijuana-only users (group 2), but more than nondrug users.

**ALCOHOL.** Expenditures for alcohol were lowest among nondrug users, significantly higher among marijuana users, yet higher among cocaine snorters, and even higher among heroin and/or crack users. The 1988 alcohol expenditures were similar among crack and heroin abusers.

## B. DRUG SELLING PATTERNS AMONG DRUG USERS

Among the drug abusers in this study, only a minority (generally under 25 percent) engage in the sale of a specific drug during a particular time period (e.g., in 1988). But among this minority, the frequencies and dollar returns are very skewed, so that over half of the sellers engage in selling more than once daily. Thus, in Table 8, category breaks were chosen so that about half of sellers of specific substances were classified into a high selling category, and the other half were placed in a lower selling category. The question is: How much do drug selling patterns vary among the drug user subgroups?

### 1. Frequency of specific drugs sold in 1988

The drug user hierarchy is significantly but modestly associated with the frequency of sales for five drugs shown in Table 8. The association is strongest for crack, heroin, and cocaine powder, marginal for alcohol, and not significant for marijuana.

**CRACK.** One-third of crack abusers sold crack in 1988, and over half of the crack sellers did so at high frequencies (four or more times daily). Subjects classified as primarily crack abusers (groups 6 and 7) have higher 1988 frequencies of crack sales than do heroin injectors (groups 4 and 5). Likewise, those who report 100 or more "lifetime" uses of crack (groups 5, 6, and 7) report higher 1988 frequencies of crack sales than do cocaine snorters and heroin injectors with less than 100 "lifetime" uses of crack (groups 3 and 4). One bivariate relationship which shows no difference is that heavy crack users (group 7) are not more frequent crack sellers than are moderate crack users (group 6). Neither do they sell more crack than heroin plus regular crack users (group 5). Among heroin plus low crack users (group 4), cocaine snorters (group 3), and marijuana users (group 2), 1988 crack sales were reasonably common (but less common than among crack users). Those classified as cocaine snorters (group 3) were somewhat less likely to sell crack in 1988 than were marijuana users (group 2), but they were more likely than nondrug users (group 1) to do so. Despite significant differences among drug user subgroups in the proportions selling crack at any time in 1988, generally about half who sell crack do so at very high frequencies (four or more times daily) in most user subgroups.

Table 8. 1988 Frequency of Sales of Specific Drugs By Lifetime Drug User Hierarchy

In 1988, Frequency of Selling:	Lifetime Drug User Hierarchy							Total (1003)	Cram- er's V Sign.
	Group 1 Nondrug User (Base N) (59)	Group 2 Mari- juana users (126)	Group 3 Cocaine Snorter (160)	Group 4 Heroin +Crack <100 (121)	Group 5 Heroin +Crack 100+ (142)	Group 6 Crack Reg (254)	Group 7 Heavy Users (141)		
<b>Crack</b>									.157 ABC EFGH
None	93	72	78	92	76	67	66	75	
<4times/day	5	18	10	6	12	17	14	13	
>3times/day	2	10	12	2	12	16	20	12	
	+ --- H --- +	--- F ---		+ ---- + B + --- +					
	--- G ---		+ ---- + C + ---- + --- +						
<b>Heroin</b>									.137 AB F
None	100	98	92	86	87	96	96	93	
<twice/day	0	0	4	9	8	2	2	4	
>Once/day	0	2	4	5	5	2	2	3	
	+ --- H --- +	--- F ---		+ ---- + B + --- +					
<b>Cocaine Powder</b>									.120 A F H
None	97	96	81	87	82	86	82	86	
<twice/day	2	2	8	7	11	7	7	7	
>Once/day	2	2	11	6	7	7	11	7	
	+ --- H --- +	--- F ---		+ ---- + B + --- +					
<b>Marijuana</b>									.096 B
None	98	94	92	93	93	86	87	91	
<twice/day	2	4	5	5	6	9	7	6	
>Once/day	0	2	3	2	1	5	6	3	
	+ --- H --- +	--- F ---		+ ---- + B + --- +					
<b>Alcohol and Other Drugs</b>									.109 A F
None	98	91	87	87	85	89	86	89	
<Once/Week	0	8	6	2	3	4	4	4	
1-3 /Week	2	1	4	10	9	5	6	5	
>3 /week	0	0	3	1	3	2	4	2	

\* Lines summarize the following significant bivariate comparisons:  
A--Overall association (p<.0001). Significant at p<.05:  
B--(4+5 vs. 6+7); C--(3+4 vs.5+6+7); D--(6 vs. 7); E--(4 vs. 5);  
F--(2 vs. 3); G--(1 vs. 2); H--(1 vs. 3).

**HEROIN.** Heroin selling is very rare among all drug user subgroups. Generally less than 8 percent sold heroin in 1988. Even among heroin injectors, only about 14 percent sold heroin in 1988. Moreover, among heroin sellers, generally less than half sell regularly (once or more per day) with no variation by regularity of their crack use. While heroin injectors (groups 4 and 5) are about 10 percent more likely to sell heroin than crack abusers (groups 6 and 7), heroin sales do not differ significantly among other groups. Thus, persons with substantial histories of heroin injection are most likely to sell heroin, but few heroin injector sell at all.

**COCAINE POWDER.** Among cocaine powder users (groups 3-7), less than 20 percent sell cocaine powder, and about half of the cocaine powder sellers do so on a daily basis. The sale of cocaine powder in 1988 is equally widespread among all groups using cocaine powder. Persons classified as cocaine snorters (group 3) are more likely to sell cocaine powder than are marijuana or nondrug users (groups 1 and 2), but the former are as likely as heroin injectors and crack abusers to sell cocaine powder.

**MARIJUANA.** Marijuana sales are not significantly associated with the drug user hierarchy. Nevertheless, it appears that persons who are primarily crack abusers (groups 6 and 7) have higher proportions with "any" and "daily" marijuana sales in 1988 than do heroin plus crack users (groups 4 and 5). Marijuana sales are quite uncommon among marijuana users and cocaine snorters (groups 2 and 3); nondrug users have very low levels of marijuana sales.

**ALCOHOL.** While the sale of alcohol<sup>12</sup> is not "legal," 15 percent or less of these subjects report selling alcohol in 1988, but over two-thirds report doing so on a weekly or more regular basis. While cocaine snorters (group 3) are more likely to sell alcohol than are marijuana users (group 2), no other significant differences in alcohol sales emerge among heroin injectors and crack abusers.

## 2. Monthly income from sales of specific drugs in 1988

Table 9 displays information about how much each subgroup of drug users earned in cash<sup>13</sup> income per month from the drugs they sold in 1988. In choosing cut-off points for sales of crack, cocaine powder, and all drugs, monthly amounts which were high (\$1,000-\$6,000) and very high (over \$6,000/month) were chosen.

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<sup>12</sup>Alcohol sales by these respondents generally involve making purchases during regular business hours, and then reselling alcohol in unlicensed places (streets, parks, after hours clubs) and/or when liquor stores are closed. While such alcohol resales are illegal and a misdemeanor crime, violators are usually fined and/or released.

Table 9. 1988 Monthly Cash Income from Drug Dealing By Lifetime Drug User Hierarchy

In 1988, the Monthly Cash Income From: (Base N)	Lifetime Drug User Hierarchy							Total (1003)	Cram- er's V Sign.
	Group 1 Nondrug User (59)	2 Mari- juana users (126)	3 Cocaine Snorter (160)	4 Heroin +Crack <100 (121)	5 Heroin +Crack 100+ (142)	6 Crack Reg (254)	7 Crack Heavy (141)		
<b>Crack</b>									.247 ABC EFG
None	93	72	81	93	77	68	64	76	
<\$1001	3	10	3	3	6	5	7	5	
\$1000-6000	2	8	6	3	12	15	15	10	
\$6001 & up	2	10	10	4	6	12	16	9	
	--- G ---		+ ----- +	C	+ ----- +	--- +			
<b>Heroin</b>									.150 AB
None	100	98	92	87	87	97	96	93	
<\$1001	0	1	2	8	4	2	1	3	
\$1001 & up	0	1	6	5	10	2	3	4	
<b>Cocaine Powder</b>									.106 A F H
None	97	96	81	88	82	86	82	86	
<1001	1	1	8	6	6	6	4	5	
\$1000-6000	3	2	5	4	6	4	9	5	
\$6001 & up	0	2	5	2	6	4	6	4	
<b>Marijuana</b>									.089 None
None	98	94	93	93	92	88	87	91	
<\$1001	0	2	5	4	5	7	6	5	
\$1001 & up	2	3	2	3	3	5	6	4	
<b>Alcohol and Other Drugs</b>									.081 None
None	98	91	89	87	86	89	89	89	
<\$1001	2	9	7	10	11	8	8	8	
\$1001 & up	0	0	4	3	3	3	3	3	
<b>All Drugs</b>									.141 ABC E GH
None	90	68	71	75	60	63	60	67	
\$1-1000	3	9	5	12	12	8	8	8	
\$1001-6000	5	9	8	9	20	11	11	11	
\$6000 & up	2	14	16	4	8	18	21	14	
	--- G ---		+ ----- +	C	+ ----- +	--- +			

\* Lines summarize the following significant bivariate comparisons:  
 A--Overall association (p<.0001). Significant at p<.05:  
 B--(4+5 vs. 6+7); C--(3+4 vs.5+6+7); D--(6 vs. 7); E--(4 vs. 5);  
 F--(2 vs. 3); G--(1 vs. 2); H--(1 vs. 3).

**CRACK SALES.** Substantial differences in 1988 income from crack sales occur among drug user subgroups. A fifth of the crack abusers earns over \$6,000 per month from crack sales. Crack abusers (groups 6 and 7) are more likely to sell crack and especially to have high and very high cash income from crack sales as compared with heroin injectors (groups 4 and 5). However, no difference in crack sale income occurs between moderate and high crack users (group 6 vs. group 7). Heroin injectors with low crack use (group 4) have the lowest proportions with crack sales and cash income from crack sales among all drug-using subgroups. Marijuana users (group 2) have among the highest proportions selling crack and obtaining high incomes from crack sales; such marijuana users have significantly higher crack sale income than cocaine snorters (group 3) or nondrug users (group 1). This income is almost as high as that of heroin plus regular crack users (group 5).

**HEROIN SALES.** Heroin sales were modestly associated with the drug user hierarchy. Not surprisingly, "any" and "high" income from heroin sales in 1988 occur mainly among heroin injector subgroups (groups 4 and 5). Persons who are primarily crack abusers, cocaine snorters, and marijuana users (groups 2, 3, 6, and 7) are very unlikely to sell heroin or to gain high income from such sales.

**COCAINE POWDER SALES.** Cocaine powder sales are equally likely among all cocaine using subgroups (groups 3-7). Less than a fifth engage in cocaine powder sales, and less than 15 percent obtain high incomes from such sales. Not surprisingly, marijuana users and nondrug users are less likely to sell cocaine powder than are cocaine snorters (group 3) and other cocaine using groups (groups 4-7).

**MARIJUANA SALES.** The drug user hierarchy is not significantly associated with marijuana sales. Generally less than 10 percent sell marijuana, and less than half of the marijuana sellers earn over \$1000 per month from such sales.

**ALCOHOL AND OTHER DRUG SALES.** The drug user hierarchy is likewise not significantly associated with sales of alcohol and other minor drugs (PCP, hallucinogens, ups, downs). Generally less than 15 percent sell alcohol and other drugs, and less than a third of such sellers earn over \$1000 per month.

**SALES OF ALL DRUGS.** Persons were asked to estimate their income from the sales of all drugs. The evidence is clear that crack sales dominate cash income from all drug sales. Among crack abusers (groups 6 and 7), the distributions for crack and all drug sales are nearly identical; the additional income from sales of heroin, cocaine powder, marijuana, and other drugs hardly adds anything to their income from crack sales. Among other drug user subgroups, crack sales are important, but sales of heroin, cocaine powder, marijuana, and other drugs may increase somewhat the proportion that sells any drug, or it may increase slightly the proportion earning above \$1000 per month. Otherwise, significant differences in drug selling income among user subgroups are nearly identical to those for crack sales.

In short, the high frequencies of crack sales among sellers and the high cash income generated via crack sales dominate the sales activities and cash income among all drug user subgroups. Crack abusers have the highest frequency of crack sales and very substantial cash incomes from crack sales. Even among drug user subgroups with limited or no crack use, such as the marijuana users and cocaine snorters (groups 2 and 3), crack sales are as frequent as, and more lucrative than, marijuana or cocaine powder sales.

As we show below, cash incomes from crack sales also greatly exceed cash income from nondrug criminality.

**C. NONDRUG CRIME PATTERNS AMONG DRUG USERS**

Among the drug abusers in this study, only a minority (generally under 10-15 percent) engage in specific nondrug crimes during a given year (e.g., 1988). But among this minority, the frequencies and dollar returns are somewhat skewed, so that a sizable minority of nondrug criminal offenders engage in a specific crime more than weekly. Thus, in Tables 10 and 11, category breaks of "less than weekly" and "weekly and more" were chosen.

**1. Frequency of nondrug criminality in 1988**

The drug user hierarchy is significantly but modestly associated with the frequency of most nondrug crimes in Tables 10 and 11. The association (Cramer's V) is strongest for robbery and various thefts (above .150), marginally significant for burglary, simple assault, and prostitution, and not significant for aggravated assault and rape.

**ROBBERY.** Generally 10 percent committed robbery in 1988 and less than half committed robbery on a weekly basis. The heavy crack abusers (group 7) were significantly more likely than regular crack abusers (group 6) to commit robbery in 1988; but the former were not more likely to do so on a weekly basis. Likewise, crack abusers (groups 5, 6, and 7) were more likely to commit robbery than cocaine snorters (groups 4 and 5). But no other differences in robbery among other drug user subgroups were significant. In short, while crack abusers were more likely to commit robbery in 1988, few differences in frequency occurred among the robbers.

**BURGLARY.** Less than 6 percent committed burglary in 1988; about a third of burglars committed burglary on a weekly basis. Crack abusers (groups 5, 6, and 7) were more likely to commit burglary in 1988 than were cocaine snorters (groups 4 and 5), but the frequency of burglary among burglars did not vary. No other differences in burglary among other drug user subgroups were significant.

**AGGRAVATED ASSAULT.** The drug user hierarchy was not significantly related to aggravated assault. Less than 8 percent of all subjects committed this crime, and very few committed aggravated assault on a weekly basis.



Table 10. 1988 Weekly Frequency of Committing Major Nondrug Crimes By Lifetime Drug User Hierarchy

In 1988, Frequency Committing:	Group	1	2	3	4	5	6	7	Total	Cram- er's V Sign.
	(Base N)	(59)	(126)	(160)	(121)	(142)	(254)	(141)		
	<u>Lifetime Drug User Hierarchy</u>									
	Nondrug User		Marijuana users	Cocaine Snorter	Heroin +crack <100	Heroin +Crack 100+	Regular	Crack Users Heavy		
<b>Robbery</b>				+ ----- + C	+ ----- +	+ ----- +	+ ----- +	+ ----- +		.154 A CD
None	95	94	96		93	86	87	77	89	
<Once/week	3	5	3		4	6	6	15	6	
1/week & up	2	1	1		3	8	7	8	5	
<b>Burglary</b>				+ ----- + C	+ ----- +	+ ----- +	+ ----- +	+ ----- +		.101 C
None	100	97	96		95	91	92	89	94	
<Once/week	0	3	3		3	5	5	8	4	
1/week & up	0	0	1		2	4	3	3	2	
<b>Aggravated assault</b>										.093 None
None	97	97	92		98	93	92	89	93	
<Once/week	3	3	6		2	6	7	9	6	
1/week & up	0	0	2		0	1	1	2	1	
<b>Rape</b>										.074 None
None	100	100	99		100	99	99	100	99	
<Once/week	0	0	0		0	1	1	0	1	
1/week & up	0	0	1		0	0	0	0	0	

\* Lines summarize the following significant bivariate comparisons:  
A--Overall association (p<.0001). Significant at p<.05:  
B--(4+5 vs. 6+7); C--(3+4 vs.5+6+7); D--(6 vs. 7); E--(4 vs. 5);  
F--(2 vs. 3); G--(1 vs. 2); H--(1 vs. 3).

Table 11. 1988 Weekly Frequency of Committing Minor Nondrug Crimes By Lifetime Drug User Hierarchy

In 1988, Frequency Committing:	Lifetime Drug User Hierarchy							Total (1003)	Cram- er's V Sign.
	Group 1 Nondrug User (Base N) (59)	Group 2 Mari- juana users (126)	Group 3 Cocaine Snorter (160)	Group 4 Heroin +crack <100 (121)	Group 5 Heroin +Crack 100+ (142)	Group 6 Reg- ular (254)	Group 7 Heavy Users (141)		
<b>Shoplifting</b>			+ ----- + C + ----- + -- +						.178 A C EF
None	92	98	----- F -----	----- E -----				83	
<Once/week	5	2						8	
1/week & up	3	0						9	
<b>Other Theft</b>			+ ----- + C + ----- + -- +						.182 A C E
None	96	95		----- E -----				83	
<Once/week	2	4						10	
1/week & up	2	1						7	
<b>Petty Larceny</b>			+ ----- + C + ----- + -- +						.153 A CD
None	95	96				--- D ---		86	
<Once/week	3	3						9	
1/week & up	2	1						5	
<b>Sale of Stolen Goods</b>			+ ----- + C + ----- + -- +						.160 A C E
None	95	96		----- E -----				85	
<Once/week	3	3						9	
1/week & up	2	1						6	
<b>Prostitution</b>			+ ----- + C + ----- + -- +						.140 ABC
None	95	94		+-----+ B +-----+				86	
<Once/week	3	5						5	
1/week & up	2	1						9	
<b>Simple Assault</b>			+ ----- + C + ----- + -- +						.146 ABC
None	90	91		+-----+ B +-----+				82	
<Once/week	10	7						15	
1/week & up	0	2						4	

\* Lines summarize the following significant bivariate comparisons:  
A--Overall association (p<.0001). Significant at p<.05:  
B--(4+5 vs. 6+7); C--(3+4 vs.5+6+7); D--(6 vs. 7); E--(4 vs. 5);  
F--(2 vs. 3); G--(1 vs. 2); H--(1 vs. 3).

**RAPE:** The drug user hierarchy was not significantly related to rape. Less than 1 percent of all subjects committed this crime, and almost no one committed rape on a weekly basis.

**SHOPLIFTING.** The drug user hierarchy was significantly and strongly related to shoplifting (Table 11). Less than a third committed shoplifting in 1988; half of shoplifters committed shoplifting on a weekly basis. Crack abusers (groups 5, 6, and 7) were more likely to shoplift in 1988 than were cocaine snorters (groups 4 and 5), and weekly shoplifting varied by drug user group. Heroin injectors with regular crack abuse (group 5) were the most likely to shoplift, and a fifth did so on a weekly basis, significantly more than among heroin plus low crack abusers (group 4) and those who were primarily crack abusers (groups 6 and 7). Cocaine snorters were more likely than marijuana users to shoplift, but they were less active in this activity than were heroin or crack users.

**OTHER THEFT (Over \$50 stolen).** The drug user hierarchy was significantly and strongly related to other thefts (larcenies). Less than a quarter committed other thefts in 1988. Generally, about a third of these thieves committed thefts on a weekly basis. Crack abusers (groups 5, 6, and 7) were more likely to commit other thefts in 1988 than were cocaine snorters (groups 4 and 5), and weekly thefts were most common among the crack abusers. Heroin injectors with regular crack abuse (group 5) were the most likely to commit other thefts, and a sixth did so on a weekly basis, significantly more frequently than heroin plus low crack abusers (group 4).

**PETTY LARCENY (Theft of goods worth less than \$50).** The drug user hierarchy was significantly but modestly related to petty larcenies. A fifth or less committed petty larceny in 1988. Generally, about a third of active persons committed petty larceny on a weekly basis. Crack abusers (groups 5, 6, and 7) were more likely than cocaine snorters (groups 4 and 5) to commit petty larceny in 1988. Heavy crack abusers (group 7) were significantly more likely to commit petty larcenies on a less than weekly basis than were regular crack abusers (group 6).

**SALE OF STOLEN GOODS.** The drug user hierarchy was significantly but modestly related to petty larcenies. A quarter or less sold stolen goods in 1988. Generally, about a third of active persons sold stolen goods on a weekly basis. Crack abusers (groups 5, 6, and 7) were more likely than cocaine snorters (groups 4 and 5) to sell stolen goods in 1988. Heroin plus regular crack abusers (group 5) were more likely than heroin plus low crack users (group 4) to sell stolen goods on a weekly basis in 1988.

**PROSTITUTION.** The drug user hierarchy was significantly but modestly related to prostitution.<sup>14</sup> A quarter or less

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<sup>14</sup>Approximately 30 percent of our respondents as well as 30 percent of the crack abusers category, were female; the data in Table 10 include the males.

committed prostitution in 1988. Generally, about two-thirds of the prostitutes did so on a weekly or more frequent basis. Crack abusers (groups 6 and 7) were more likely to engage in prostitution in 1988 than were heroin injectors (groups 4 and 5) or than cocaine snorters (groups 3 and 4). Prostitution on a weekly basis was most common among crack abusers, especially heavy crack abusers.

**SIMPLE ASSAULT.** The drug user hierarchy was significantly but modestly related to simple assaults. Less than a quarter committed simple assaults in 1988. Generally, less than a quarter of these assaulters committed simple assault on a weekly basis. Crack abusers (groups 5, 6, and 7) were more likely to commit simple assault in 1988 than were cocaine snorters (groups 4 and 5), and weekly assaults were most common among crack abusers. The crack abusers (groups 6 and 7) were more likely to commit simple assault, especially on a weekly basis, than were heroin injectors (groups 4 and 5).

Overall, crack abusers are more likely than other drug user subgroups to commit each of the nondrug crimes. The heavy crack abusers (group 7) have the highest proportions committing robbery, simple assaults, and prostitution, and among the highest proportions committing these and other crimes on weekly basis. Heroin injectors with regular crack abuse (group 5) have equivalent or somewhat higher proportions involved in weekly property crimes (especially shoplifting), other thefts, petty larceny, and sale of stolen goods.

## 2. Monthly income from specific nondrug crimes in 1988

Table 12 provides information about how much each subgroup of drug users earned in cash income per month from these nondrug crimes in 1988. A monthly income of \$500 or more was considered high amount for these crimes. For all of the nondrug crimes generating cash income<sup>15</sup> in Table 12, the drug user hierarchy was

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<sup>15</sup>Subjects were asked to specify the "net" dollar amounts they earned in cash from these crimes. The value of stolen goods kept or given away are not included here. Assaults and rape do not provide cash income or returns; subjects were not asked to report incomes from these crimes.

Table 12. 1988 Monthly Cash Income from Nondrug Crimes by Lifetime Drug User Hierarchy

In 1988, Monthly Cash Income from:	Lifetime Drug User Hierarchy							Total (1003)	Cram- er's V Sign.
	Group 1 Nondrug User (Base N 59)	Group 2 Mari- juana users (126)	Group 3 Cocaine Snorter (160)	Group 4 Heroin +crack <100 (121)	Group 5 Heroin +Crack 100+ (142)	Group 6 Reg- ular (254)	Group 7 Crack Users Heavy (141)		
<b>Robbery</b>			+ ----- +	C	+ ----- +	----- +			.143 A C
None	97	94	96	93	87	87	77	89	
<\$501	3	3	3	3	6	6	10	5	
>500	0	3	1	4	7	7	13	6	
<b>Burglary</b>			+ ----- +	C	+ ----- +	----- +			.105 A C
None	100	98	96	95	90	92	89	94	
<\$501	0	2	1	3	4	4	5	3	
>500	0	0	3	2	6	4	6	3	
<b>Shoplifting</b>			+ ----- +	C	+ ----- +	----- +			.176 A C F
None	91	98	92	81	70	81	78	84	
<\$501	7	2	6	11	13	13	11	9	
>500	2	0	2	8	17	6	11	7	
<b>Other Theft</b>			+ ----- +	C	+ ----- +	----- +			.172 A C E
None	96	96	90	88	73	78	75	83	
<\$501	2	3	8	10	14	15	16	11	
>500	2	1	2	2	13	7	9	6	
<b>Petty Larceny</b>			+ ----- +	C	+ ----- +	----- +			.132 A C
None	95	96	92	87	80	81	81	86	
<\$501	5	3	7	11	16	17	16	12	
>500	0	1	1	2	4	2	3	2	
<b>Stolen Goods</b>			+ ----- +	C	+ ----- +	----- +			.166 A C E
None	95	96	92	88	77	82	77	85	
<\$501	3	4	5	9	13	16	17	11	
>500	2	0	3	3	10	2	6	4	
<b>Prostitution</b>			+ ----- +	C	+ ----- +	----- +			.144 ABC
None	97	94	90	90	88	82	75	87	
<\$501	3	4	5	7	3	8	11	6	
>500	0	2	5	3	9	10	14	7	

\* Lines summarize the following significant bivariate comparisons:  
A--Overall association (p<.0001). Significant at p<.05:  
B--(4+5 vs. 6+7); C--(3+4 vs.5+6+7); D--(6 vs. 7); E--(4 vs. 5);  
F--(2 vs. 3); G--(1 vs. 2); H--(1 vs. 3).

significantly but modestly associated with cash income from each specific nondrug crime. Moreover, subjects with regular crack abuse (groups 5, 6, and 7) had significantly greater cash incomes than did cocaine powder users (groups 3 and 4) from each specific class nondrug offense.

**ROBBERY.** Less than 15 percent gained income from robbery, and in 1988 about half the robbers earned over \$500 per month from their robberies. While heavy crack abusers (group 7) had the largest proportion (13 percent) with high income from robbery, they were not significantly different from the regular crack abusers (group 6).

**BURGLARY.** Less than 10 percent gained income from burglary, and in 1988 about half the burglars earned over \$500 per month from their burglaries. Heavy crack abusers (group 7) and heroin plus regular crack users (group 5) had burglary incomes slightly but not significantly higher than those of other groups.

**SHOPLIFTING.** Less than 25 percent gained income from shoplifting, and in 1988 less than half the shoplifters gained over \$500 per month from their shoplifting activity. Heavy crack abusers (group 7) and heroin plus regular crack users (group 5) had slightly but not significantly higher shoplifting incomes than did other groups. Marijuana users had the lowest proportion with shoplifting income.

**OTHER THEFT.** Less than 25 percent gained income from other theft, and in 1988 a third of the thieves gained over \$500 per month from their other thefts. Heroin plus regular crack users (group 5) had the highest "other theft" incomes. These were significantly higher than among heroin plus low crack users (group 4).

**PETTY LARCENY.** Less than 20 percent gained income from petty theft, but in 1988 very small proportions gained over \$500 per month from petty thefts.

**SALE OF STOLEN GOODS.** Less than 25 percent gained income from selling stolen goods, but in 1988 about a third of stolen goods sellers gained over \$500 per month from this activity. Heroin plus regular crack users (group 5) had the highest incomes from sale of stolen goods. These were significantly higher than among heroin plus low crack users (group 4).

**PROSTITUTION.** Less than 25 percent gained income from prostitution, but in 1988 over half of all prostitutes gained over \$500 per month in 1988 from their prostitution activity. Those who were primarily crack abusers (groups 6 and 7) were significantly more active in prostitution than were heroin injectors (groups 4 and 5).

#### D. LIFESTYLES OF DRUG USER SUBGROUPS

In this section, the complex lifestyles of different subgroups in the drug user hierarchy are described. For each specific subgroup, the following description summarizes findings about their lifetime drug use (Table 5), frequencies of drug use and drug expenditures in 1988 (Tables 6 and 7), frequencies of drug sales in drug selling income in 1988 (Tables 8 and 9), and the frequencies of, and income from, nondrug crimes (Tables 10, 11 and 12). Only those characteristics (variables) which make a specific subgroup unique or different from similar subgroups are mentioned.

##### PRIMARILY CRACK ABUSERS

By definition, persons classified in groups 6 and 7 report over 100 lifetime uses of crack, but they have essentially avoided heroin injection (10 or fewer uses in a lifetime). Heavy crack abusers (group 7) report 1,000 or more lifetime uses of crack, while regular crack abusers report 101 to 999 lifetime uses of crack.

This definition also captures the major patterns of drugs used and routes of administration (Table 4). Not only have crack abusers avoided heroin injection, but they have also avoided heroin snorting, illicit methadone use, and injection of cocaine or speedballs. Yet crack abusers have among the highest proportions who, during the course of their lifetime, engage in cocaine snorting and freebasing, as well as marijuana, PCP, and alcohol use.

**1988 Drug Use Patterns.** The 1988 drug use patterns of both groups (6 and 7) is very clear (Tables 6 and 7). Crack is their primary drug of abuse, with alcohol, marijuana, and cocaine

powder constituting preferred secondary drugs. Heroin use is uncommon (by definition). Over two-thirds smoked crack on a daily basis, and in 1988 two-fifths spent over \$1,000 per month for crack. They also have the highest frequencies of, and expenditures for, alcohol and marijuana use of all drug user subgroups, although only about a third use alcohol or marijuana on a daily basis or expend over \$50 per month on these substances. Only about half of these crack abusers used cocaine powder in 1988; only about a fifth used cocaine powder on a daily basis or spent over \$500 per month on it. Less than 15 percent used heroin in 1988. Only about 5 percent used heroin daily and/or spent over \$500 per month on heroin.

While the two crack abuser subgroups (6 and 7) have nearly identical proportions using (and expending some funds for) each substance, heavy crack abusers (group 7) usually have substantially higher proportions (54 percent) than regular crack abusers (group 6--30 percent) using crack four or more times daily and expending over \$1000 per month on the drug (55 vs. 37 percent). Heavy crack users also have higher proportions using cocaine powder (24 vs. 12 percent) and alcohol (35 vs. 21 percent) on a daily basis than do regular crack abusers. However, they do not report higher expenditures for these substances.

With the possible exception of group 5 (see below), these crack abusers have the largest proportion of people engaged in the highest expenditures and frequencies of use for all drugs combined. Such large proportions (30-50 percent) are consuming crack four and more times daily, and are expending such large



sums on it, that their overall level of substance abuse is probably double or triple that of other drug users (with the exception of group 5).

1988 Drug Sale Patterns. Crack sales (Tables 8 and 9) are a primary criminal activity among a third of these crack abusers, and a fifth engage in four or more crack sales per day. A fifth of crack abusers net over \$6000 per month from such crack sales.<sup>16</sup> While crack abusers have the highest proportions selling cocaine powder, marijuana, and alcohol, generally under 10 percent of crack abusers earn more than \$1,000 per month from the sale of such noncrack drugs. Among crack abusers, the net returns from crack selling makes this much more lucrative than the sale of other drugs.

1988 Patterns of Nondrug Criminality. Heavy crack abusers (group 7) have the largest proportion engaging in robbery and prostitution and receiving high incomes from these crimes (Tables 10, 11 and 12). Crack abusers (groups 6 and 7) also have among the second largest proportion involved in burglary,

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<sup>16</sup>Ethnographic research currently under way suggests that many daily crack abusers are consuming crack on 5 to 30 occasions per day, with wide variability in consumption on different days. Likewise, crack sellers typically make many more than 4 sales per day; 15 to 50 crack sales per day are typical for persons selling for 8 hours or more per day. On the other hand, many crack sellers and crack users may fail to remember the days of the month when they do not sell or use crack. (There have been similar findings for cocaine powder sellers--see Johnson, Kaplan, Schmeidler 1990). In short, not every crack seller who claims daily selling activity may actually sell crack every single day, but on days when they do sell crack, 4-5 sales would be "very bad" business, and 20 or more sales would be quite common. Moreover their estimates of high cash incomes (over \$6,000/month) from crack sales appear credible for regular daily sellers, as are high monthly expenditures (over \$1,000/month) for crack.

assaults, shoplifting, other thefts, petty larceny, and sale of stolen goods. Moreover, they have among the largest proportion who gaining over \$500 per month from these nondrug crimes.

As compared with other drug-using subgroups in this study, crack abusers appear to have drug involvements that are much more "intensive" (larger proportions using crack multiple times a day) and "extensive" (high proportions using several drugs daily and engaging in sales of several drugs and various nondrug crimes). These crack abusers have much higher frequencies of crack use (over half use crack daily and most use it several times a day). They also have equivalent frequencies of cocaine powder, marijuana, and alcohol use (but not heroin injection) when compared with the other drug user subgroups (with the exception group 5). Moreover, crack abusers have very high rates of crack sales and receive large cash incomes from them. While they are among the most active in other crimes (cocaine powder sales, marijuana sales, robbery, prostitution, various forms of theft), the crack abusers receive cash incomes from these crimes that do not rival (and appear to supplement) the income from crack sales.

#### HEROIN INJECTORS

Subjects were classified in these categories if they reported more than 10 lifetime uses of heroin by injection. Most of the persons so classified had injected heroin for several years (Tables 2 and 4). Such heroin injectors were classified into two subgroups, those using crack more than 100 times and those using it less often. Heroin injectors with moderate and low crack use are distinctive due to their use of heroin and/or cocaine powder by injection (other subgroups rarely inject drugs-see Table 4).

These two subgroups of heroin injectors have highest (nearly identical) proportions characterized by "lifetime" cocaine and speedball injection, heroin snorting, and use of illicit methadone (Table 4). They also have very similar "lifetime" use of secondary drugs (marijuana, PCP, psychedelics, ups, downs, alcohol).

These two heroin injector subgroups differ dramatically in their lifetime use of cocaine. Heroin plus moderate crack users (group 5) are as likely to engage in cocaine freebasing and cocaine snorting as are the heavy crack abusers (group 7), but the heroin plus low crack users (group 4) are less apt to report "lifetime" freebasing or cocaine snorting (Table 4) than are cocaine snorters (group 3--see below).

1988 Drug Use Patterns. Heroin plus low crack users (group 4) appears to be quite similar to heroin injectors studied in the early 1980s (Johnson et al. 1985), before crack became widespread. Two-fifths used heroin in 1988, and two-fifths were daily injectors of heroin and also cocaine powder (primarily speedballers). About two-fifths of group 4 spend over \$500 a month each for heroin and cocaine powder. In 1988, group 4 avoided crack (about three-fifths report no use or no expenditures for it), or they engaged in irregular crack use only (about a fifth used crack daily or spent over \$100 a month for crack--Tables 6 and 7).

Heroin plus regular crack users (Group 5) appear to have shifted to crack as their primary drug of abuse while continuing heroin injection and speedballing (Tables 6 and 7). Thus, in 1988 two-thirds of group 5 smoked crack daily and two-fifths smoked it four or more times daily and expended over \$1,000 a month on it. Their consumption of crack was only slightly less

than that of the heaviest crack abusers (group 7), and somewhat higher than that of the regular crack abusers (group 6). On the other hand, about half of group 5 avoided (did not inject) heroin in 1988, while a quarter injected it so on a daily basis and a third spent over \$500 a month for it. The heroin consumption of group 5 was significantly less than that of group 4, but their crack use was much greater.

These two groups have very similar 1988 patterns of secondary drug use. The frequencies of use and expenditures for cocaine powder, marijuana, and alcohol do not differ significantly. Compared with other drug user subgroups (excluding nondrug users), heroin injectors are among those with the highest proportion of daily users of cocaine powder and alcohol, but with the lowest proportion of using marijuana.

1988 Drug Sale Patterns. Crack sales (Tables 8 and 9) are committed by a quarter of heroin plus moderate crack abusers (group 5), and half of the crack sellers engage in four or more crack sales per day. A quarter of these heroin abusers net over \$1000 per month from such crack sales. Heroin plus low crack users (group 4) have the lowest proportion (among all cocaine-using groups) engaging in crack sales (Table 8). While they have the lowest cash income from crack sales, they earn more from crack sales than they do from heroin sales (Tables 9). Yet both heroin groups (4 and 5) have very similar but small, proportions selling heroin, cocaine powder, marijuana, and alcohol. The cash income earned by heroin injectors via crack selling, especially among moderate crack abusers (group 5), is much greater than from sales of other drugs.

1988 Patterns of Nondrug Criminality. Heroin plus moderate crack abusers (group 5) have the largest proportion engaged in shoplifting, other thefts, and sale of stolen goods. They also have the highest incomes from these crimes (Tables 11 and 12). Heroin plus low crack users (group 4) have considerably smaller proportion engaged in all nondrug crimes, as well as lower incomes from them. Their incomes are almost as low as for cocaine snorters and marijuana users. Heroin plus crack users (groups 4 and 5) appear to have somewhat less involvement in serious crimes (robbery, burglary, assaults) than do the crack users (groups 6 and 7), but the the "heroin" vs. "crack" user differences do not reach significance for any crime.

Overall, heroin injectors who have added crack to their existing patterns of polydrug abuse, behave very much like the heavy crack abusers (group 7), but continue their heroin injection and speedballing (perhaps at a slightly reduced level). Much of their cash income is derived from crack sales, and most expenditures go for crack rather than heroin. They also appear to prefer larcenies (shoplifting, other thefts, sales of stolen goods) as a major secondary source of cash income.

On the other hand, heroin injectors who only experiment with crack (100 times or less--group 4) have the highest proportions injecting heroin and cocaine powder on a daily basis (Table 5), and with high (over \$500 a month) expenditures for these drugs (Table 6). Yet they do not have especially large proportions selling heroin or cocaine powder, nor do they exhibit other favorite nondrug crimes. Although they are among the user subgroups least likely to sell crack on a daily basis, they

appear to gain more cash income from crack sales than from heroin sales (Table 8)--mainly to support their daily speedballing (i.e., heroin plus cocaine powder use) (Table 5).

#### COCAINE SNORTERS.

By definition, persons classified into group 3 have used crack less than 100 times in a lifetime, injected heroin less than 10 times, and snorted cocaine more than 10 times. Although defined primarily by the (relative) absence of crack and the more regular nasal inhalation of cocaine powder, such cocaine snorters have limited involvements in cocaine freebasing, but appear to avoid cocaine injection, speedballing, heroin snorting, and illicit methadone. Compared with heroin injectors, they have slightly smaller proportions using secondary drugs (PCP, psychedelics, ups, downs, alcohol) more than 100 times in a lifetime (Table 4).

1988 Drug Use Patterns. Partly by definition, cocaine snorters have much less crack use and heroin injection in 1988 than do persons in groups 4 through 7. Surprisingly, only 18 percent of cocaine snorters use cocaine powder on a daily basis, a lower proportion than among heroin injectors (groups 4 and 5), and about the same proportion as among crack abusers (groups 6 and 7) (Table 6). Cocaine snorters also spend less on cocaine powder than do heroin injectors and only slightly more than crack abusers (Table 7).

Cocaine snorters use cocaine powder much more frequently (and expend more money on it) than do marijuana and nondrug users (by definition). At the same time, they also use alcohol more frequently than do marijuana and nondrug users, and they spend more money on it. Cocaine snorters use marijuana less frequently than marijuana users (group 2).

1988 Drug Sale Patterns. While cocaine snorters are among the groups with the highest proportion selling cocaine powder, heavy crack sellers (group 7) sells as frequently. Moreover, a large proportion of cocaine snorters sells crack as or more frequently than cocaine powder and earns much more cash income from crack than from cocaine powder sales (Table 9). Their sales of heroin, marijuana, and alcohol are generally modest, and are equal to or less than the same sales among crack users (groups 5, 6, and 7).

1988 Patterns of Nondrug Criminality. Cocaine snorters (group 3) have modest to low proportions engaging in any specific nondrug crime. Their incomes from nondrug crimes are among the lowest of any of the drug user subgroups (Tables 10, 11, and 12).

In short, cocaine snorters constitute an intermediate drug user group; they have less (or equally) intensive patterns of cocaine powder consumption than do crack abusers and heroin injectors, but more intensive drug consumption than marijuana and nondrug users. They also engage in crack selling and to derive more cash income from crack sales than from sales of cocaine powder. Their involvements in, and cash incomes from, nondrug crimes are quite modest.

#### MARIJUANA USERS

Marijuana users were so classified because they reported less than 10 episodes involving cocaine powder, heroin injection, and crack, but claimed more than 10 "lifetimes" uses of marijuana. While a few of these marijuana users experimented with (i.e., fewer than used 10 times) crack, cocaine powder, heroin (snorting), they did not report using these drugs more

than 100 times in a lifetime. While the vast majority of marijuana users reported avoiding other drugs, a minority reported occasional experimentation with other drugs (Table 4).

1988 Drug Use Patterns. By definition, marijuana users<sup>17</sup> have among the lowest proportions of all groups using (and expending money for) crack, cocaine powder, and heroin. On the other hand, marijuana users do not have the highest frequencies of marijuana use, although they appear to have about the highest expenditures for marijuana in 1988 (Tables 6 and 7). Crack abusers have similar or higher frequencies of use and expenditures for marijuana, as do cocaine snorters. Heroin injectors have slightly lower frequencies of marijuana use than do marijuana users. Marijuana users use alcohol less frequently than do cocaine-using subgroups (groups 3-7), but they are more frequent alcohol consumers than nondrug users.

1988 Drug Sale Patterns. Marijuana users have an equal (but not higher) proportion selling marijuana as compared with other drug user subgroups (Table 8). Larger numbers of marijuana users sell crack than sell marijuana; they also earn much more from money from crack sales than from marijuana sales (Table 9). Moreover, in 1988 the proportion of marijuana users selling crack on a daily basis is only slightly smaller than for crack abusers (groups 6 and 7). Thus, marijuana users earn much more cash

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<sup>17</sup>Approximately half of the persons classified as marijuana users were recruited from the streets as a comparison group. But the other half of the marijuana users (and nondrug users--see below), were interviewed in jail or prison. Most such inmates claimed that they avoided drugs or only used marijuana, and that they were selling crack to make money and had been arrested for selling crack.



income from crack than from marijuana sales (Table 9). Their sales of heroin, cocaine powder, marijuana, and alcohol are generally as low as among nondrug users (group 1).

1988 Patterns of Nondrug Criminality. Marijuana users (group 2) have among the lowest proportions engaged in any specific nondrug crime, and almost none engages in nondrug crimes on a weekly basis (Tables 10 and 11). Their incomes from nondrug crimes are the lowest of any of the drug user subgroups and nearly as low as among nondrug users (Table 12).

Thus, marijuana users constitute a drug user group exhibiting limited involvement in most deviant behaviors examined here (except crack sales). They have equally (or less) intensive patterns of marijuana consumption when compared with crack abusers, but their marijuana use is more intensive than that of heroin injectors. They also engage in crack selling and to derive more cash income from crack sales than from sales of marijuana. Their involvements in, and cash incomes from, nondrug crimes are very low.

#### NONDRUG USERS

By definition, those who reported 10 or fewer "lifetime" uses of marijuana, cocaine powder, heroin, and crack were classified as nondrug users. While they reported some experimental use of other illicit drugs, alcohol use was relatively common. However, nondrug users had the lowest alcohol use of all subgroups (Table 4).

1988 Drug Use Patterns. In 1988 by definition, nondrug users were (and should have been) very irregular users of illicit drugs. They were the least frequent users of alcohol and spent the least amount of money for alcohol (as well as for all illicit drugs). The data reveal, however, both limited use and regular

use of various illegal drugs among those classified as nondrug users.<sup>18</sup> But relative to other drug users in this study, those classified as nondrug users are much less intensively and extensively involved with substances and crime.

**1988 Drug Sale Patterns.** Nondrug users have the lowest (usually negligible) proportions engaged in the sale of illicit drugs and alcohol (Table 8). Nevertheless, the sale of crack by nondrug users (although limited) provides them with more cash income than do sales of other drugs (Table 9).

**1988 Patterns of Nondrug Criminality.** Nondrug users (group 1) have the smallest proportions engaged in specific nondrug crimes, and almost none engages in nondrug crimes on a weekly basis (Tables 10 and 11). Their incomes from nondrug crimes are the lowest of all subgroups (Table 11).

Hence, nondrug users are generally the least active subgroup in virtually all dimensions of behavior examined here (drug use, drug sales, and nondrug criminality). This is consistent with a much larger epidemiological literature showing very limited deviance among those who avoid illicit drugs.

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<sup>18</sup>Those classified here as nondrug users were not "purists" who have never used illicit drugs. The limited use of drugs reported in Tables 6, 7, and 8 is due in part to: 1) operational definitions (e.g., persons using illicit drugs 1 times or less in a lifetime were operationally defined as "nonusers" even if they had engaged in experimental use primarily in a given time period, such as 1988; and 2) inconsistent answers (subjects may have understated their use during early questioning that involved the lifetime use questions), but may have been more honest as rapport built up during later questioning (that concerned annual frequency and expenses for drugs). In comparison with nondrug users in epidemiological surveys (Johnston, O'Malley, Bachman 1990; National Institute on Drug Abuse 1989, Frank et al. 1988), several of our nondrug users would clearly be classified as users of various drugs. In future research, staff will systematically examine patterns of inconsistent answers and classify persons as total illicit drug abstainers or as experimental users of various drugs.

#### REFLECTIONS ON THE DRUG USER HIERARCHY

There is evidence suggesting the usefulness of the Drug User Hierarchy. Although this hierarchy was based upon lifetime use questions and crude cut off points (10; 100; 1,000) for only four drugs (crack, heroin injection, cocaine powder, and marijuana), it effectively differentiates among major drug user patterns (primarily crack abusers, heroin injectors, cocaine snorters, marijuana users, and nondrug users). For all of these groups, the hierarchy reveals important patterns of polydrug use both in the "lifetime" category and in 1988. Marijuana and alcohol are used by most of these subgroups, and on a daily basis by substantial minorities.

The hierarchy also documents subtle distinctions in use and sale patterns that are not evident in the definition of drug user categories. For example, those who have used crack over 100 times can be distinguished mainly according to whether they also inject heroin (group 5) or avoid it (groups 6 and 7) and by the proportion using crack four and more times daily in 1988 (30 percent for group 6 vs. 54 percent for group 7). These subjects (groups 5, 6, and 7) also have the highest rates of crack selling and the greatest involvement in nondrug criminality.

Among heroin injectors, moderate crack users (group 5) appear to have shifted to crack as their primary drug of abuse, with less routine levels of heroin injection, while the heroin plus low crack users (group 4) appear to be primarily speedballers (and to use cocaine powder as frequently as heroin), with only irregular crack use.

**SUMMARY OF MAIN FINDINGS**

- . Crack abusers are using drugs at high rates, and with greater cash returns, than are those whose drug use is limited to heroin injection, cocaine snorting, or marijuana consumption, or who do not use drugs at all.<sup>19</sup>
  
- . Crack abusers (who use crack over 100 times in a lifetime --groups 5, 6, 7) are significantly different from other drug user subgroups on many dimensions. They generally have the highest proportions involved in, and receiving high incomes from drug sales and other criminality.
  
- . Among crack abusers, crack use greatly exceeds the cost and frequency of use of other specific drugs which they also consume.
  
- . Crack abusers have higher frequencies and cash incomes from other crimes (robbery, burglary, thefts, etc.) than cocaine powder users. Crack abusers and heroin injectors have similar and high frequencies and incomes from such other crimes.
  
- . By 1988, crack has become the most frequently sold and lucrative drug in the street drug market. While crack abusers (groups 5-7) sell more frequently and obtain higher incomes from crack sales, substantial proportions of cocaine

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<sup>19</sup>Future reports will document the extent to which different subgroups of drug users in 1984 added crack to their existing patterns of drug abuse, and whether and how the frequencies of drug use, and the expenditures, changed across the last half of the 1980s. Also several reports emerging from this project, which document the impact of crack abusers and sellers upon the criminal justice system, are listed in Appendix B.

snorters and marijuana users also deal and earn higher incomes from selling crack than from their sales of cocaine powder or marijuana. Crack selling is the most frequent crime and generates the largest cash income crime for all illicit drug user subgroups.

- . Crack sales generate higher cash incomes than the sale of heroin, cocaine powder, marijuana, or the commission of nondrug crimes (robbery, burglary, thefts, etc.).<sup>20</sup>
- . The prototypical heroin addict who injects heroin and/or speedballs on a daily basis (and uses marijuana and alcohol on a regular basis), but who avoids or only experiments with crack (group 4), appears to be relatively uncommon among drug users in New York City in 1988. While such heroin abusers are most active in various forms of larceny, they also appear to engage in crack sales to support their heroin consumption.

#### POLICY IMPLICATIONS

These findings have important implications for social policy directed towards drug abusers. First, social policy directed at controlling and limiting the selling activities of crack dealers may undermine the economic returns with which various drug (crack, heroin, cocaine, marijuana) users finance their drug use. Second, there is an urgent need for expansion of treatment slots

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<sup>20</sup>See Johnson et al. (1990) on the reasons for the popularity of crack sales in the last half of the 1980s, as well as the consequences for crack users and inner-city communities.

for crack abusers, and for the development of new treatment methods specifically designed for them (especially for crack abuser not injecting heroin). Yet rarely are these available to the numerous crack abusers in this study. Third, continuing research is needed to document the career paths in drug use/sale and nondrug criminality, and the changing patterns of drug abuse among the cohort of persons who became crack abusers in the late 1980s.

Future analyses of these data are planned and designed to address the extent to which criminal justice sanctions (arrest, probation, jail, prison) and voluntary treatment affected drug use, drug sale, and nondrug crime patterns among the various subgroups of substance abusers.

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APPENDIX A:

RESEARCH METHODOLOGY

In fall of 1987, the National Institute of Justice funded the New York City Criminal Justice Agency (CJA) to conduct a major study of "Crack and Changing Patterns of Drug Use/Abuse and Criminality."<sup>21</sup> Since there exists no technique to sample crack and drug abusers with a known probability, purposive sampling was employed. A limited description of the methodology is provided here. Further elaboration will be provided in future reports.

The investigators defined several social contexts in which crack users and noncrack drug abusers were likely to be found in large numbers: 1) "Street drug abusers" were identified by staff and recruited from the streets, primarily in the Harlem and Washington Heights areas of Northern Manhattan, where crack abuse crack sales, and crack arrests were among the highest in New York City. 2) "Arrested, but released" persons living in Northern Manhattan had been arrested on crack-related charges but were located and interviewed after release from detention. 3) "Jail inmates," about half of whom were awaiting trial and half of whom

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<sup>21</sup>Jeffrey Fagan, Bruce D. Johnson, and Steven Belenko (1987, 1988) were the Co-Principal Investigators. The original application to the National Institute of Justice (February 1987) provided a lengthy rationale and justification for the subject selection process which is briefly described here. Additional NIJ funding was received in the fall of 1988 to collect data from subjects in drug treatment, jail, and prison settings. CJA contracted with Narcotic and Drug Research, Inc. to conduct all the fieldwork, complete the interviews, and edit schedules for data entry. CJA entered and cleaned the data and made it available for statistical analysis. Additional support for the analysis of these data was provided by the New York State Division of Substance Abuse Services and by the National Institute on Drug Abuse (R 01 DA05126-02). Anticipated funding from the National Institute on Drug Abuse will support two more years (1990-1992) of secondary analyses of these data to address issues about the impact of crack on drug selling and criminal careers from 1984 through 1989 (Johnson and Fagan 1990).

were sentenced misdemeanants (serving less than a year), were interviewed at Rikers Island. 4) "Prison inmates" were convicted felons serving sentences in medium security prisons in New York State. 5) "Probationers and Parolees" were recruited from the streets of New York City and were currently under criminal justice supervision. 6) "Drug treatment clients" were enrolled in a residential drug treatment and a crack detoxification program when interviewed. Persons interviewed in jail, prison, or treatment settings were recruited without regard to where they lived, although almost all subjects lived in New York City.

In each of these social contexts, the investigators set quotas so that approximately two-thirds of the subjects would be crack users (people who had used crack 10 or more times in their lives), and one-third would have used crack fewer than 10 times, or never, though they may have used other drugs on a regular basis. Skilled locators and/or interviewers were able to locate many willing candidates on the streets of northern Manhattan as well as in other settings (Dunlap et al. 1990). Prior to participating in the main interview, potential subjects completed a short "screener" interview in which they were asked about their patterns of drug use. People were interviewed according to the quotas being sought at the time (thus, crack users and heroin injectors were not interviewed if staff were seeking only cocaine snorters at that time). In jail and prison settings, the screening criterion was whether the inmate had been convicted on a crack sale or possession charge, or had been convicted for some nondrug charge (robbery, burglary, theft, homicide). Sometimes treatment staff at the institution referred persons whom they knew to have particular patterns of drug use.

All interviews were completed in 12 months, between August 1988 and July 1989. Approximately half of the subjects were interviewed during 1988; the other half (especially those in jails, prisons, and treatment programs) were interviewed in 1989. Dunlap et al. (1990) provides details of recruitment, training of interviewers, techniques for locating crack abusers on the street, and obtaining high quality interviews with such hard-to-reach populations.

Clearly built into the screening-selection process was a hierarchy of involvement with drugs that constitutes the major independent variable. In each social context, staff tried (within the limits of financial resources) to locate sizable subsamples of persons who were: 1) crack users and abusers with little or no heroin injection history; 2) crack users and abusers with significant heroin injection histories;<sup>22</sup> 3) cocaine users who snorted or injected cocaine, but had little or no experience with crack or heroin injection; 4) marijuana-only users with little or no use of cocaine, heroin, or crack; 5) nondrug users. The nondrug users were recruited in the same manner and from the same neighborhoods as the drug-using/abusing subjects.

Subjects who met the screening criteria were interviewed for one to two hours about several topics, of which three are the focus (and dependent variables) of this report: 1) Measures of drug use patterns derived from questions regarding 14 drugs and

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<sup>22</sup>Despite efforts to locate them, heroin injectors who avoided crack entirely were not recruited in sufficient numbers to form a separate category. Likewise persons using crack, cocaine, or heroin injection, or marijuana less than 10 times in their lifetime were included with "never" users of those substances, because such (1-9 times) experimental involvements did not appear to constitute consumption resembling "abuse" which is of most interest for this report.

routes of administration (e.g., cocaine use via snorting, injection, freebasing, and smoking crack). These elicited data on age of initiation, age of first regular use, and lifetime frequency, as well as on the frequency and monetary cost of use for the period from 1984 to 1989. 2) Measures of drug distribution derived from questions about six drugs (crack, heroin, cocaine, marijuana, pills, alcohol). Interviewers obtained information on age of initiation, age of first regular involvement, and lifetime frequency, as well as on the frequency of sales and dollar amounts earned between 1984 and 1989. 3) Measures of nondrug criminality derived from questions about 12 crimes (robbery, burglary, shoplifting, other theft, prostitution/pimping, etc.). These obtained data on age of first commission, age of first regular involvement, and lifetime frequency, as well as on the frequency of involvement in such crimes, and the dollar amounts earned from them, for the interval from 1984 to 1989. Interviewers were carefully trained to spot inconsistent answers from one part of the interview schedule to the next, and to ask subjects to resolve inconsistencies. As a partial result, only 15 schedules (out of a total of 1,018) were excluded by analytic staff due to incompleteness, major discrepancies in self-reports or evidence of subjects' lying. All completed interviews were carefully edited, checked for internal consistency, and cleaned prior to data analysis.

#### Measures of Association

Since the Drug User Hierarchy contains nominal categories, regular measures of association (Pearson's  $\chi^2$ ) are not appropriate. Cramer's V provides the best measure of association for variables with nominal categories (which are not ordinal or

interval). Like Pearson's correlation, Cramer's V may range from zero to one. Cramer's V may have a high value when one or two categories of the independent variable are very different from other categories, even though these categories are "in the middle" of the scale. For example, in Table 6, the Cramer's V for heroin injection (.295) is substantial because over half of the heroin plus crack users inject heroin (and a third do so on a daily basis), while less than a quarter of other user groups injected heroin in 1988. Norusis (1988:B-100) notes that "chi-square-based measures of association are hard to interpret. Although when properly standardized they can be used to compare strength of association in several tables, the 'strength of association' being compared is not easily related to an intuitive measure of association."

APPENDIX B:

RELATED PUBLICATIONS ON CRACK AND COCAINE USE  
AVAILABLE FROM AUTHORS

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CHANGING PATTERNS OF DRUG ABUSE  
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