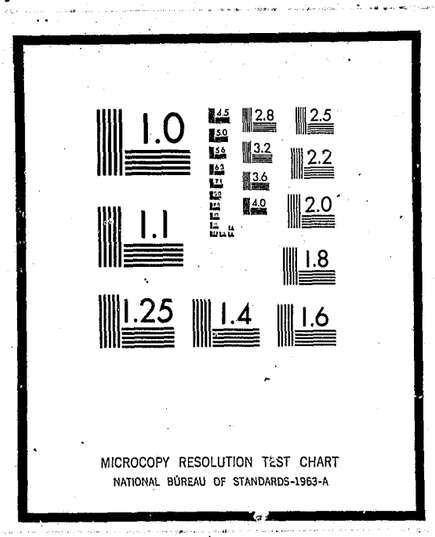

7

Seattle -

EVALUATION OF NARCOTICS BUY MONEY

GRANT AWARD CONTRACT #1017

Prepared by: V. A. Van Der Hyde, Jr.
Kenneth E. Mathews, Jr.
Doris Lock
Seattle Law and Justice Planning Office

May 1975

The conduct of this study and the preparation of this report were aided in part by a grant from the United States Department of Justice, the Law Enforcement Assistance Administration, and the Washington State Law and Justice Planning Office pursuant to Title I of Public Law 90-351.

Summary Evaluation Report

Narcotics Buy Money
Grant Award Contract #1017
August 1, 1973 - January 31, 1975

Hypothesis:

That an increase in the amount of money available to the police for the purchase of narcotics would result in an increased ability to "buy-up" into higher and more important levels of the narcotics distribution system, and result in the successful criminal prosecutions of those offenders.

Operational Description:

During the period of August 1, 1973, through January 31, 1975, the Narcotics Section of the Seattle Police Department had available to it just over $43,000 in grant buy monies, beyond the appropriated City funds, for the purpose of making undercover purchases of narcotics. The grant money was intended to facilitate the detection and arrest of narcotics dealers who act as suppliers to the lower level street dealers, and hence have available to them larger quantities of narcotics. In order to do this, an undercover police officer must establish himself as a buyer and work up the chain of "connections" making ever larger and more expensive purchases.

Impact Evaluation:

Comparisons of pre and post grant periods indicated that:

1. A significant increase in the amount of narcotics obtained occurred during the grant period.
2. No significant increase in the number of charges filed resulted during the grant period.
3. The police and especially the Narcotics Section have shifted priorities toward making hard drug arrests.
4. Narcotics offenders were very likely to have prior Part I felony records.

Comments:

Even though no increase was found in the number of charges filed on heroin and cocaine dealers, the significant increase in the amount of narcotics obtained is taken as evidence that the arrests that did result were of individuals of greater importance in the narcotics distribution system than those previously arrested. In the cases examined, it was also found that the type of narcotic or drug involvement was of more importance in relationship to sentencing outcome than was the presence or absence of a prior criminal history. Finally, it is evident that the economic impact of drug related crime, at least by heroin and cocaine users, has been overestimated and that other sources of income must be available to these users.

EVALUATION OF NARCOTICS BUY MONEY

Grant Award Contract 1017

Grant Amount	$50,000
Applicant's Contribution	
Contributed Goods and Services	10,000
Appropriated Funds	6,667
Total Project Cost	66,667

Grant Period: June 1, 1973 to May 31, 1974
Revised to Aug 1, 1973 to January 31, 1975

The goal of this grant was the reduction of the number of narcotics dealers operating in Seattle above the "street" level dealer in an attempt to interdict the flow of narcotics into the city. Two objectives were involved. (1). To demonstrate a statistically significant increase in the number of charges filed on dealers operating at higher levels in the narcotics distribution system. (2). To demonstrate a significant increase in the number of successful prosecutions resulting from charges against those who violate the narcotics law by the unauthorized sale or possession of narcotics.

The methods used to attain these objectives were essentially those already in use by the Narcotics Division of the Seattle Police Department (SPD), namely the development of intelligence sources among members of the narcotics community, and the undercover posing of officers as addicts or dealers so as to make a series of purchases of narcotics at ever higher levels in the drug system. The assumption was that an increase in the amount of buy monies available to undercover officers would enable them to buy quantities

of narcotics that only those in a middle or higher level of the system would be in a position to sell.

Results

Objective 1: To demonstrate, first, a statistically significant increase in the number of charges filed; and second, to demonstrate that those on whom charges were filed came from higher levels of the narcotics distribution system.

There were problems with the quality and interpretation of data on both of these questions in objective 1. In the first case, the arrest or charges filed data could have easily been inflated by simply arresting, or re-arresting, more of the known addicts and street level dealers. Thus, while the number of charges were simple to obtain, that alone says little about the relative importance of those persons in the narcotics system. The second question, dealing specifically with the level of the arrestee in the system, had the problem of determining what data could be used as an objective and stable indicator of that standing. While the Narcotics Division had developed a rating scale for the arrests made using grant money, there was no way of applying that scale to the pre-grant arrests for comparative purposes. Of necessity the quantity of narcotics purchased or seized became the only stable and empirical indicator available, and this must be used with caution. If it can be shown that the amount of narcotics seized or purchased significantly exceeded what would have been expected to have been purchased simply by the infusion of

additional buy money, then this may be taken as an indication that the subjects involved were of a higher position in the distribution system than mere street dealers, simply because they had available to them the larger quantity of narcotics.

The following discussion is based on the data shown in Table 1. During the pre-grant comparison period of September 1, 1972 through August 31, 1973 a total of 95 heroin and cocaine related charges were filed by the Narcotics Division involving seizures and/or buys totaling 680 grams of heroin and cocaine, an average of 7.16 grams per charge. During this period a total of $46,625 was available to the Narcotics Division as buy monies.

During the grant period $42,728 in appropriated city funds were available as buy money, and these resulted in the filing of 71 heroin and cocaine charges and the seizure or purchase of 1796 grams of heroin or cocaine, an average of 25.30 grams per charge. In addition, during the grant period of February 1, 1974 through January 31, 1975, an additional $43,334 in grant monies resulted in the filing of 34 heroin or cocaine charges in a total of 135 investigations. Some of these investigations are still pending and are not further discussed here. The total narcotics seized or purchased using the grant funds were 660 grams, an average of 19.41 grams per charge. The total money expended during the grant period then totaled $86,082 which resulted in a total of 105 charges being filed

involving heroin and/or cocaine, and a total of 2456 grams of the narcotics being purchased or seized, an average of 23.39 grams per charge. Information on the amount of narcotics purchased versus the amount of narcotics seized in connection with the charges was not available.

Table 1. NUMBER OF CHARGES FILED, BUY MONEY AVAILABLE, AND AMOUNT OF NARCOTICS OBTAINED FOR PRE-GRANT AND GRANT PERIODS

	Pre-Grant Period	Grant Period
Number of Charges Filed	95	105
Buy Money Available	$46,625	$86,062
Narcotics Obtained (Grams)	680	2456

A statistical test was first run on the number of charges filed by month during the pre-grant and grant periods. The result indicated that there was no statistically significant difference in the number of charges filed during the two periods (t - .28).

A second statistical test was performed on the data comparing the pre-grant and grant periods in terms of the number of grams obtained per charge. The results of that test were inconclusive, but may be taken conservatively as showing that no statistically significant difference was found in the amount of narcotics purchased or seized per charge filed in the two periods. (See Methodological Note A.)

A third statistical test was done in terms of the number of dollars expended per gram of narcotic during the pre-grant and grant periods. Here a statistically significant difference was found, indicating that the increase from 680 grams of heroin and cocaine purchased or seized in the pre-grant period to the 2456 grams of narcotics seized or purchased during the grant period, an increase of 261 percent or more than three times the pre-grant level, was not due simply to the increase in the level of buy monies available. (See Methodological Note B.) That is, given that $46,625 was spent during the pre-grant period and produced 680 grams of heroin and cocaine, one would expect, AT THE SAME RATE, that $86,062 would produce 1255 grams of heroin and cocaine. Instead, twice that amount was obtained, some 2456 grams. Alternatively, if the ratio of grams of narcotics per charge were to remain the same, and given that the 95 charges in the pre-grant period resulted in 680 grams of narcotics, one would expect that 105 charges during

the grant period would produce 752 grams of narcotics. Instead, an additional 1701 grams were obtained, an average increase of 16.23 grams per charge. A statistical test was run on these data which shows that this increase is significant. (See Methodological Note C.)

In summary, then, while the number of charges filed did not increase significantly, the infusion of additional buy monies did result in a significant increase in the amount of heroin and cocaine obtained beyond that which would have been expected on a constant dollars per gram basis. To the extent to which the quantity obtained per charge is a reflection of the importance or position in the drug distribution of that subject, an increase in the Narcotics Division's ability to penetrate higher levels in that system has been shown.

Objective 2: To demonstrate a significant increase in the number of prosecutions for drug offenses.

Final court disposition data was obtained for two samples of narcotics offenders. The first group consisted of fifty who had been charged during the grant period by the Narcotics Division of the SPD. A second group of fifty narcotics offenders who had been charged during the pre-grant period was also chosen at random. Table 2 presents the trial outcomes for the two groups. (See Table 2.)

There was no statistically significant difference between the two groups in terms of sentencing outcomes. The additional buy money did not result in a significant increase in the proportion of successful prosecutions in terms of the number of offenders who received jail or prison terms. While not statistically significant, it should be noted that the number

Table 2. TRIAL OUTCOMES FOR GRANT AND PRE-GRANT SAMPLES OF NARCOTICS OFFENDERS

Outcome	Grant Period	Pre-Grant Period
Dismissed	4	9
Not Guilty	3	3
Suspended	6	8
Deferred	22	13
Suspended-Deferred Plus County Jail Time or County Jail Time Only[1]	7	9
Prison	8	8
Total	50	50

Chi square = 4.77 df = 5 C = .21

of cases resulting in dismissals for the grant period were less than half those of the pre-grant period, and that the number of subjects receiving deferred sentences did increase.

The next step was to try to find a factor which might help account for the lack of significant differences in sentencing between the two groups. The most likely factor seemed to be that of prior criminal history.

In an attempt to discover the extent to which the courts[2] take into account the prior criminal history of heroin and cocaine offenders in the trial process, a sample of twenty subjects was chosen from a pre-grant sample on the basis of the extent of their criminal histories. Ten subjects were chosen who had no prior Part I felonies, and ten were also

[1] Includes cases placed on work release; does not include cases where jail time reduced to "time served" or time was less than 7 days.

[2] Courts here meaning both judge and jury decisions and sentencing.

chosen who had at least five such felony convictions. The resulting tabulation is shown below in Table 3.

Table 3. PRIOR PART I CRIMINAL HISTORIES AND TRIAL OUTCOMES FOR SELECTED HEROIN-COCAINE OFFENDERS

Subject	No Prior Part I Felonies	Five or More Prior Part I Felonies
1	Deferred	Not Yet At Trial
2	Deferred	Hung Jury
3	Deferred	Bench Warrant Issued
4	Suspended	Deferred
5	Suspended	1 Year County Jail
6	Deferred	10 Years Prison
7	Deferred	At Trial--No Verdict
8	Deferred	10 Years Prison--On Appeal
9	Suspended	90 Days County Jail
10	Deferred	10 Years Prison

None of the subjects who had not had a prior Part I offense received a jail or prison term. On the other hand those with extensive criminal histories appear, on the basis of this small sample, to exhibit two tendencies. First, they were more likely to be sentenced to jail or prison terms. Second, at the same time many appear to be able to postpone or defer the criminal justice process by delaying trial, presenting appeals, and absconding under bond or bail. Since the above discussion relates only to heroin and cocaine offenders, it is natural to ask whether or not the same pattern emerges with respect to other drug offenders.

To answer this question a sample of fifty subjects was taken from those convicted of any drug charge during the grant period. Because of the relatively small sample size it was necessary to dichotomize the data into those who had received any jail time versus those who had not. Table 4a shows the data for the total sample of fifty.

Table 4a. SENTENCING OUTCOME BY CRIMINAL HISTORY FOR A SAMPLE OF CONVICTED NARCOTICS OFFENDERS

	Criminal History		No Criminal History		Total	
	No.	%	No.	%	No.	%
Jail Term	14	64	15	54	29	58
No Jail Term	8	36	13	46	21	42
Total	22	100	28	100	50	100

Chi square = 0.51
df = 1
C = .10

The statistical test was not significant, indicating that the possession of a criminal history did not affect the decision of the court on whether or not to award jail time. But, as we have implied, this may mask the influence of a third variable, the type of drug involved in the case. Using the data from Table 4a, a pair of partial tables (4b and 4c) were contructed showing the relationship between criminal history and jail time for heroin-cocaine offenders on the one hand and all other drug offenders on the other.

Table 4b. SENTENCING OUTCOME BY CRIMINAL HISTORY FOR SAMPLE OF CONVICTED HEROIN-COCAINE OFFENDERS

	Criminal History		No Criminal History		Total	
	No.	%	No.	%	No.	%
Jail Term	12	71	7	70	19	70
No Jail Term	5	29	3	30	8	30
Total	17	100	10	100	27	100

Table 4c. SENTENCING OUTCOME BY CRIMINAL HISTORY FOR SAMPLE OF CONVICTED NARCOTICS OFFENDERS--ALL EXCEPT HEROIN-COCAINE

	Criminal History		No Criminal History		Total	
	No.	%	No.	%	No.	%
Jail Term	2	40	8	44	10	43
No Jail Term	3	60	10	56	13	57
Total	5	100	18	100	23	100

While the cell frequencies are small, the percentage distributions within each table are revealing. Note that in the original table 4a more than half of all those convicted received jail time regardless of whether or not they had a criminal history. When looking at Table 4b, containing only those who had been convicted of heroir or cocaine charges, the percentage increases to 70 percent. A change also occurs in Table 4c, but in the opposite direction. Here less than 50 percent of those convicted of any drug offense other than heroin or cocaine received jail time. It is evident that it is the type of drug--heroin and cocaine--which led to a jail or prison term. If heroin and cocaine are considered to be the most serious of the drug charges, then it is the case that those offenders convicted of those offenses receive more severe penalties. What has happened is that the courts have acted on the basis of the perceived severity of the drug involved and not in terms of the prior criminal history. The obvious question, one of both policy and law, is: to what extant should the courts use prior criminal activities as a guide in sentencing?

Let us now turn to a further inference drawn from the objective of increasing the number of successful prosecutions of narcotics offenders. On the assumption that heroin and cocaine are defined by most members of the criminal justice system as being the most serious of the drug charges, data will be presented examining the changing emphasis or priority which the police have placed on the apprehension of various

drug offenders. It should be borne in mind that it is the change in the distribution of arrests that is of interest and not simply the number of arrests. Numbers of arrests are, of course, partially a function of the proportion of the population that uses any given drug. Changes in arrest distribution are more likely to be reflective of policy changes than raw arrest numbers.

Table 5 below shows the total number of drug charges filed by the Seattle Police Department by drug type for the years 1973 and 1974. It can be seen that the total number of drug charges declined by 8.3 percent from 1973 to 1974, largely because of the reduced number of marijuana and hashish charges, but also because of declines in other areas. An increase of almost 26 percent in the number of heroin and cocaine related charges occured during the same period.

Table 5. NARCOTICS AND DRUG CHARGES FILED BY THE SEATTLE POLICE DEPARTMENT FOR THE YEARS 1973 AND 1974

	1973		1974		Percent Change
	No.	%	No.	%	
Heroin and Cocaine	116	7.6	146	10.5	+ 25.9
Hallucinogens	51	3.4	47	3.4	- 7.8
Amphetamines	186	12.2	182	13.1	- 2.2
Barbiturates	86	5.7	33	2.4	- 61.6
Marijuana and Hashish	1059	69.7	952	68.2	- 10.1
Forged Prescriptions	16	1.1	33	2.4	+106.3
Unknown	5	0.3	0	0.0	--
Total	1519	100.0	1393	100.0	- 8.3

Table 6, below, shows similar data for the Narcotics Division of the SPD. The very slight increase in the number of charges filed by the Narcotics Division (Note that this constitutes a sub-set of the entire department's charges.)

does not indicate the pronounced changes which occurred in terms of the distribution of individual drug charges filed. The number of marijuana and hashish charges filed decline 23.4 percent from 1973 to 1974, and the barbiturate charges declined 62.5 percent. (Note the small frequencies, however.) Of more interest is the 46.1 percent increase in the number of heroin and cocaine related charges. This increase is greater than for the Department as a whole, of which the Narcotics Division is, of course, a part. No doubt the Department's increase is in large part due to the Narcotics Divisions efforts, increasing the significance of that Divisions efforts. It should also be noted that, for the large number of marijuana charges in 1974 the Narcotics Division issued only 41 citations, none of which were to juveniles, while making 37 felony arrests. On the other hand the Department's totals show that of the 952 marijuana and hashish charges, 733 were citations, of which 227 were to juveniles and 506 to adults.

Table 6. NARCOTICS AND DRUG CHARGES FILED BY THE NARCOTICS DIVISION OF THE SPD FOR THE YEARS 1973 AND 1974

	1973		1974		Percent Change
	No.	%	No.	%	
Heroin and Cocaine	76	26.0	111	37.8	+ 46.1
Hallucinogens	20	6.9	24	8.2	+ 20.0
Amphetamines	59	20.2	56	19.0	- 5.1
Barbiturates	16	5.5	6	2.0	- 62.5
Marijuana and Hashish	111	38.0	85	28.9	- 23.4
Forged Prescriptions	4	1.4	12	4.1	+ 200.0
Unknown	6	2.0	0	0.0	--
Total	292	100.0	294	100.0	+ 0.7

The clear implication of these data is that, while the emphasis of the Department as a whole has shifted somewhat away from marijuana and toward heroin and coaine investigations, the Narcotics Division has shifted priorities even more toward emphasizing hard drug arrests. It is evident that increasing priority has been given to cocaine and heroin by the Narcotics Division.

While showing a significant increase in the amount of narcotics purchased or seized, a further important question to be asked is how much these offenders are further engaged in the serious Part I felonies. If narcotics offenders are not likely to be involved in other serious crime, then perhaps less emphasis need be placed on them. On the other hand, if narcotics offenders commit a disproportionate number of serious felonies then focusing on that group may be an effective way of reducing the overall Part I crime rate.

To answer this question a sample of 67 subjects charged with heroin-cocaine offenses in 1973 was obtained and their criminal histories located in the records of the Seattle Police Department. That sample had a total of 182 Part I offenses; only 12 had no prior Part I offense charged against them, and only 3 had no prior narcotics related arrest. Thus only 18 percent of the sample had no prior Part I arrest and only 4.5 percent had not had a prior narcotics arrest.

If this sample is representative of narcotics charges generally, these data would indicate that those arrested for

heroin-cocaine offenses have most often also been arrested for Part I offenses and almost all would have been arrested on previous narcotics charges. This would indicate a very substantial crossover from narcotics offenses to other serious offenses on the part of these individuals.

It is almost automatic to ask whether or not this is also the case for non-narcotics offenders. A sample of 99 non-narcotics offenders were drawn at random from Police Department records of those who had been arrested in 1973. Table 7 below shows the results.

Table 7. MISDEMEANOR AND PART I FELONY RECORDS FOR A RANDOM SAMPLE OF ARRESTEES DURING 1973

	Number of Misdemeanors											
	0	1	2	3	4	5	6	7	8	9	10	Total
Number of Part I Felonies 0		44	5	2	7	4	1	2	1		4	70
1	6	3	3	1	1		1				4	19
2			1	1	1	2	1				1	7
3												
4			1								1	2
5												
6												
7												
8												
9				1								1
10												
Total	6	47	10	5	9	6	3	2	1	0	10	99

r = .173

Of the 99 subjects, 6 had committed a Part I offense, but no misdemeanors, and 70 had committed at least one misdemeanor but no Part I felony. That leaves a total of 23 who had some combination of Part I felonies and misdemeanors. Note that only ten of the 99 had committed more than one Part I felony offense, and that only three had records of more than two

such offenses. A test statistic was run on the data ($r = .173$) which indicated that misdemeanor and felony histories were independent of each other, so that it is not possible to predict one kind of arrest history by virture of the fact that an offender has a history of the other kind of offenses. Finally, a Wald-Wolfowitz Runs Test was performed on the 23 subjects having both misdemeanor and Part I felony records to determine if there were some pattern of occurrance. The resulting $Z = -1.39$ was less than the $Z = 1.96$ required for statistical significance at $p = .05$. Thus there was no pattern among these 23 subjects. In this sample it was not possible to say that the misdemeanor arrests consistently preceded or followed arrests for Part I felonies.

Thus, as compared with narcotics offenders, there would appear to be very little crossover from one kind of criminal activity to another, and, indeed, there is less likelihood of the non-narcotics offender having a felony record at all. However, for the narcotics offender sample 82 percent had at least one Part I felony (non-narcotic). This compares with only 29 percent of the non-narcotics offenders arrested during the same year who had a record of a Part I felony.

This evaluation has been limited to the consideration of a small number of variables. Such problems as the number of heroin addicts, the number of middle and high level heroin dealers, changes in the narcotics distribution system, the mobility of dealers in that system and the proportion

of convicted dealers who return to their drug selling activities have been ignored. None of these questions are, as yet, susceptible to empirical evaluation simply because reliable data is almost totally nonexistant.

On other questions a limited amount of information is available, which has tended to show that, in this evaluation, increased narcotics buy monies does buy increased narcotics above and beyond what would have been expected based simply on the same dollar rate or charge rate. That is, it is possible to buy up into the higher quantity levels of the narcotics system. It was also shown that the emphasis has shifted from marijuana and hashish to the control of the heroin and cocaine traffic. With regard to court dispositions, there is evidence that the type of drug involved was more important in the sentencing process than was a criminal history, and that there was substantial involvement in Part I offenses by narcotics offenders.

There is one final area that calls for comment. There are a number of assumptions about the relationships between the cost of a heroin habit, the dosage used by the addict, the street value of the narcotic and the involvement of the addict in criminal activities--especially property offenses.

The police have claimed that there are "between 2000 and 5000 hard core drug addicts in the Greater Seattle area today" (SPD LEAA grant application, p.4). It is also claimed that at a per day habit of an average of $50 this

results in at least $100,000 per day or $36,500,000 per year cash flow to narcotics dealers.

Let us, for the sake of argument, say that there are 4000 such addicts in Seattle--the real number is, of course, unknown. According to the SPD evaluation of the narcotics seized using the LEAA grant funds, their street value was on the order of some $530,600 (Evaluation grant, p. 3). Since the amount seized during the grant period using the grant money was approximately 660 grams, this places the street value per gram at $804. If the average per injection dose per addict is 10 mg. (Brecher, 1972, Licit and Illicit Drugs, p. 104) taken four times a day this would mean a daily per capita expenditure of $32.16 (4 x 10 mg. divided by 1000 mg. x $804 per gram value). This, given 4000 addicts means a daily outlay of $128,640 or $46,953,600 a year--almost $47,000,000.

Let us now look at the value of the Part I offenses that occurred in Seattle in the past year. According to the SPD (Crime Capsule, Data Processing Section, January 29, 1975), the amount of property stolen in connection with Part I crimes totaled to $12,479,750, of which $4,911,389 was recovered.

If we ignore the amount recovered and use the total loss figure, but assume that only about half of the burglaries, larcenies and robberies were reported, we arrive at a figure of $24,959,000. If this volume were sold at half its worth on the black market, we get a figure of just

under $12,500,000, which is probably a high estimate.

When the crime figure of $12,500,000 is compared to the estimate narcotics use cost figure of $47,000,000, three conclusions are possible.

1. The estimate of 4000 drug addicts may be substantially in error, a gross inflation of the true addict population.
2. The percapita daily value or dose cost of a drug habit may have been seriously over estimated.
3. Even assuming that every Part I offense involving stolen property was committed by a narcotics addict and the resulting money used only to feed a habit rather than for other kinds of support--food, clothes, rent--only 26 percent of the 4000 addicts could be using crime as their sole means of supporting a drug habit.

In point of fact, it is probable that all three of these conclusions are at least in large part true. That there are substantially fewer than 4000 addicts, that the cost of the maintenance of a habit is less than estimated, and that the relationship between addiction and crime as a means of supporting a drug habit is much less than is popularly believed.

In summary, then, this evaluation indicates:

1. That while the influx of additional buy monies on the

part of the grant did not result in a significant increase in the number of charges filed, it did result in a significant increase in the amount of narcotics obtained.

2. That the increase in the amount of narcotics obtained is an indication that those on whom charges were filed did represent more important members of the drug distribution system than were being previously charged.

3. That it is the type of drug involved rather than the presence or absence of a criminal history that leads to incarceration, and that heroin and cocaine offenders do receive more severe sentences.

4. That there has been, in the last two years, a shift in priorities in drug arrests toward heroin and cocaine arrests.

5. That narcotics offenders are very likely to have been involved in other criminal activities, including Part I felonies.

6. That the economic impact of crime related activities on the part of heroin users is substantially less than is popularly supposed, because there may be fewer addicts than previously estimated, because the per capita cost of addiction may be lower than previously estimated, or that addicts make substantial amounts of their money from legitimate activities.

APPENDIX

Methodological Note A.

It was found that the sample variances s_1 and s_2 for the pre-grant and grant period samples respectively differed significantly.

$$F = \frac{s_2}{s_1} = \frac{839.84}{73.81} = 11.37$$ which is statistically significant

(See Edwards, 1972: 98-99.)

Because of this difference in variances, it was decided to use a more conservative version of the conventional t-test (Edwards, 1972: 100). In this procedure a critical t is produced for comparison with the t found in the usual manner where two sample variances are used and the sample n's are different.

The critical value of t =

$$\frac{t_1 s_1^2 + t_2 s_2^2}{\frac{s_1^2}{n_1} + \frac{s_1^2}{n_2}}$$

where t_1 and t_2 are the critical values of t obtained from the table of t values for their respective degrees of freedom based on the different n's. The calculated critical value t was 2.012 in this case.

The usual t_1 calculated by the formula

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} = 1.75$$

Because the critical value of t (2.012) is not exceeded by the test value of t (1.75), the null hypothesis of no significant statistical difference cannot be rejected, and we are forced to conclude that the means of the narcotics seizures and purchases in the two time periods did not differ significantly.

This was not the only problem however, It was also found that the two samples were both positively skewed, calling into question the second assumption necessary for making

a t-test (See Hays, 1973: 410 for guidance on both assumptions of normality and homogeneity of variance).

The moment coefficient of skewness is defined by the formula $\gamma = m_3/m_2\sqrt{m_2}$ (See Downie and Heath, 1965: 61).

For these samples γ = 3.35 and 4.27 respectively for the grant and pre-grant periods. Taken together the demonstrated skewness of both samples and the heterogeneity of variance of both samples require a most cautious interpretation of the resulting t-test.

What the skewed distributions indicate is that a small number of charges accounted for a substantial proportion of the narcotics obtained in both cases. The heterogeneity of variance of the samples is in part a reflection of sample size, but also of the great differences in the amounts of the narcotics involved, ranging from less than 1/10 of a gram to over 150 grams.

A median test was also performed, where chi-square =

$$\frac{N(|AD - BC| - \frac{N}{2})^2}{(A + B)(C + D)(A + C)(B + D)}$$

which yielded chi-square = 1.37 at 1 degree of freedom which has the probability of occurrance under H_o of .12 (one tail test).

The data were also set into a log transform and a t-test performed. A t value of 1.82 with 88 degrees of freedom was found. This is not significant at p = .05 for a two tail test, but is significant for p = .05 in a one tail test. Finally, some argument might be made that the significance of the F test, above, is an indication that the buy monies resulted in a small number of significantly larger narcotic acquisitions, hence increasing the grant period variance. This is not the most orthodox interpretation however, and it was thought best to interpret the results in a conservative manner.

Methodological Note B.

The mean number of dollars per gram of narcotic during the pre-grant period was 68.57. The mean number of dollars per gram of narcotic druing the grant period was 35.04. Are these means statistically different? If it is assumed that the variance for the entire set of subjects in the pre-grant and grant periods were the same as was found for sub-sets of these subjects as found above in Methodological Note A, and this was found to be the case for those in the grant period, then the computation of a t-test for comparative purposes is possible along the same lines as before.

Where $t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} = \frac{s_2^2}{n_2}}} = 11.33$

The critical t is calculated as before with t_1 = 1.986 and t_2 = 1.984. This results in a critical t value of 1.9. Since the calculated t of 11.33 exceeds the critical t of 1.90, the null hypothesis of no significant difference is rejected.

Methodological Note C.

If we again allow the assumption that the pre-grant and grant period variances were as was found for the sub-set of subjects in those periods in Methodological Note A, then again a t-statistic may be calculated and compared to a critical t value. Now the t value is found to be 5.48, and the critical t is found to be 1.90. Since the calculated t value exceeds the critical t value, the null hypothesis of no significant statistical difference is rejected.

BIBLIOGRAPHY

Downie, N. M. and Heath, R. W. 1965
Basic Statistical Methods 2nd Ed.
Harper and Row

Edwards, Allan 1972
Experimental Design in Psychological Research
Holt, Rinehart and Winston

Hays, William 1973
Statistics for the Social Sciences 2nd Ed.
Holt, Rinehart and Winston