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Evaluation of Drug Abuse Treatments

Based on First Year Followup

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Evaluation of Drug Abuse Treatments

Based on First Year Followup

National Followup Study of Admissions
to Drug Abuse Treatments in the DARP
During 1969-1972

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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OVERVIEW OF FINDINGS

A sample of 3131 admissions to 25 different DARP drug abuse treatment agencies during 1969-72 were followed up and interviewed during 1975-76. The present study was based on 2178 black and white males from this sample who were in DARP Methadone Maintenance (MM), Therapeutic Communities (TC), Drug Free Treatments (DF), and Detoxification programs (DT). A comparison group was also included in the study, based on persons who completed formal admission procedures but never returned to receive treatment in DARP (Intake Only, IO). The purpose of the study was (1) to compare Pre DARP baseline levels for criterion measures with Post DARP outcomes based on the first year after leaving DARP, (2) to compare the DARP treatment groups on the basis of first year Post DARP outcomes, after making statistical adjustments for population differences between these groups, and (3) to examine client characteristics and DARP treatment measures in relation to differential outcomes in the first year Post DARP, conducted separately for each of the DARP treatment groups. The findings are summarized below.

Changes from Pre DARP to Post DARP. Drug use (opioid, nonopioid, marihuana, and alcohol), employment, and criminality indicators were compared before and after DARP treatment (see Figures 1, 2, & 3, pages 13, 15, & 16). Statistically significant improvements were generally found for the MM, TC, and DF groups, but not for the DT and IO groups (see Summary, page 17).

- Opioid use decreased in all groups, but more so in MM and TC
- Nonopioid use decreased in MM, TC, and DF
- Marihuana use increased in MM, and alcohol use increased in all groups except DF
- Employment increased in MM, TC, and DF
- Arrest rate decreased in MM.

Comparisons between DARP treatment groups. Group comparisons were made for drug use, employment, incarcerations in jail, and treatment reentries in the first year Post DARP, but after statistical adjustments were made for demographic, background, Pre DARP treatment history, and baseline measures (see Figure 4, page 22). The MM, TC, and DF groups (especially TC) tended to have significantly more favorable outcomes than DT and IO (see Summary, page 25).

- MM, TC, and DF had lower opioid and nonopioid use and higher employment than DT and IO
- TC had the lowest marihuana use, but none of the groups differed on alcohol use
- TC and DF had the lowest rate of return to drug treatments
- MM had the lowest rate of incarcerations in jail.

Differential outcomes within DARP treatment groups. A hierarchical analytic model was used to examine outcomes in the first year Post DARP in relation to client demographic variables, background factors, Pre DARP treatment history, criterion baseline factors, and During DARP treatment performance. These predictors, ordered chronologically, were used in the analysis of Post DARP drug use, employment, incarcerations in jail, treatment reentries, and an overall composite measure within each DARP treatment group. Statistically significant associations were observed between predictors and outcomes, although the pattern of results was frequently specific to the particular criteria and treatment groups involved (see pages 64-73). The most consistent result was that low Pre DARP criminality and favorable During DARP performance (in terms of low social deviance and relatively longer time in treatment) were related to more favorable Post DARP outcomes.

The implications of the findings are that the most favorable Post DARP outcomes are associated with MM, TC, and DF treatments. The choice of which of these treatments is best, however, depends partially on the values and expectations of the reader in relation to the goals and philosophies of the different treatment modalities. The general issue of treatment effectiveness, along with several other important methodological and substantive points, are addressed on pages 74-76.

EVALUATION OF DRUG ABUSE TREATMENTS BASED ON FIRST YEAR FOLLOWUP

National Followup Study of Admissions to Drug Abuse Treatments in the DARP During 1969-1972

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CHAPTER ONE -- INTRODUCTION

The Drug Abuse Reporting Program (DARP) was established as a patient reporting and tracking system, supported by the National Institute on Drug Abuse (NIDA) and previously by the National Institute of Mental Health (NIMH), to provide a data base for the evaluation of treatment. Data were collected on a total of approximately 44,000 clients admitted to treatment at 52 agencies throughout the United States and in Puerto Rico. Admissions were recorded between June 1, 1969 and March 31, 1973, and bimonthly status evaluation reports up to termination from treatment were continued up to March 31, 1974.

During the first 2 years of DARP data collection the major effort was on building the file. Research activities were initiated in 1971 and involved (1) classification studies of patient populations, treatment types, and drug use patterns, (2) measurement studies, to convert information in the DARP forms to measurement scales of client characteristics, treatment program characteristics, and criterion performance that demonstrated desirable statistical properties, (3) descriptive population summaries on various topics, such as drug and alcohol use, (4) epidemiological studies, of addict deaths, transition rates, correlates of drug use patterns, and others, and (5) evaluation studies of three admission cohorts (1969-1971, 1971-1972, and 1972-1973) based on tenure and termination and behavioral criteria observed during treatment. This extensive research, through 1975, involved some 40 separate monographs which were published in a five-volume series (Sells 1974 a, b; Sells & Simpson 1976 a, b, c).

In August 1974, followup studies of samples of the first two cohorts were authorized and the field work was completed between March 1975 and October 1976. Followup of the third cohort is currently in progress. The Cohort 1 and 2 target samples included a total of 4107 former clients and resulted in 3131 completed interviews (77 percent) from 25 different DARP treatment programs across the United States and Puerto Rico. Altogether, 87 percent of the original sample was located, even though 10 percent of these could not be interviewed; 6 percent were deceased, 1 percent were out of the country, and 3 percent used their right to refuse the interview.

Followup interviews were conducted face-to-face by trained interviewers using strict procedures to protect the confidentiality of the data. The average duration of each interview was approximately one hour, for which the

respondent was paid 10 dollars. The interview focused on criterion behaviors including living arrangements, employment, criminality, drug use, alcohol consumption and return to treatment; these data were recorded on a month-to-month basis from the time the respondent left the DARP treatment program to the time of the followup interview. Checks of internal consistency as well as comparisons of self-report information with criminal justice records of Post DARP incarcerations and treatment reentry records supported the reliability and validity of the data (Simpson, Lloyd, & Gent 1976). The information obtained in the followup interview, along with background and baseline records previously completed for each person at the time of admission to treatment in DARP and bimonthly status evaluation records completed throughout the duration of treatment, comprised the data base for the followup studies. The present study is one of several investigations in this followup research based on DARP Cohorts 1 and 2, and focuses mainly on changes from pretreatment through the period during treatment to the first full year following departure from DARP treatment.

Methodological Considerations

The present study was based only on outcomes during the first year after DARP termination even though there was up to 6 years of followup data obtained for some persons. There were two principal reasons for this restriction. The first was methodological and was based on the desire to assure a uniform time period for comparisons between different client and treatment groups. An example of the importance of this uniform time period is that the probability that a person will be arrested, use drugs, or be employed one or more times is greater over a 5-year time interval than a 1-year interval. Although such data can be "adjusted" to reflect an annual rate, there might also be time-related variations that would be more difficult to take into account.

The followup interviews for Cohorts 1 and 2 were conducted during 1975-76, 4 to 6 years after clients were admitted to DARP treatment. The actual length of time in the followup period, however, depended on how long each client remained in DARP treatment; for instance, persons with long tenure in DARP treatment necessarily had shorter time elapsed at posttreatment followup than persons with short tenure. Overall, 100 percent of the sample followed in Cohorts 1 and 2 had one full year of followup data, 92 percent had 2 years, 74 percent had 3 years, 28 percent had 4 years, 3 percent had 5 years, and only 1 percent had over 5 years. Furthermore, the differences in the amount of time in the followup period (i.e., the time between DARP treatment termination and the followup interview) were not random in the DARP sample. Clients in relatively long-term treatment programs (such as methadone maintenance) typically had less time in the followup period than did clients in shorter term treatment programs (such as outpatient detoxification). Likewise, clients who quit treatment or were expelled by the program often had less time in DARP treatment (and more time in the followup period) than clients who successfully completed treatment.

The second justification for restricting this study to first Post DARP year outcomes was substantive. This time interval represents a period of reasonable length to which the effects of DARP treatment should be most directly related. When a person leaves the sheltered and protective environment of the treatment program, the influence on behavioral outcomes of family, health, job, and many other significant factors must be considered, quite apart from the effects of treatment per se. As time after treatment extends, more such events may occur and factors other than treatment that contribute to alternative explanations of behavior change would be expected to increase in importance. Many of these factors revolve around the personal life of the individual and related social adjustments, such as in family relations

and employment. Others, however, involve the effects of social interventions such as imprisonment or subsequent drug treatment experiences. Later drug treatments represent a particularly important consideration since they add a new dimension to the treatment experiences evaluated. These factors obviously are not absent in the first year following DARP, but they are less prominent as sources of alternative explanations of behavior during the first year than during subsequent years after DARP.

Preliminary examination of drug and alcohol use, employment and criminality in Cohort 1 over the years after DARP revealed some instances of time-related trends, but each measure tended to be highly correlated with itself from one Post DARP year to another (Hornick, Demaree, Sells, & Neman 1977; Savage & Simpson 1976; Simpson & Lloyd 1976). As a result, the findings of the present study based only on the first year after DARP can be expected to generalize to later time periods. Nevertheless, several other studies in the present followup research specifically address the followup data beyond the first year.

Purpose of the Study

The particular objectives of this study are threefold: (1) to examine changes on specific criterion measures from before DARP treatment (Pre DARP) to the first year after DARP treatment (Post DARP); (2) to compare DARP treatment groups on outcome measures in the first year Post DARP; and (3) to evaluate the contributions of client and treatment characteristics to first year Post DARP outcomes and to identify those that account for significant proportions of variance in the Post DARP outcomes. The outcome measures used in these analyses represent illicit drug use, alcohol consumption, employment, criminality indicators, and return to drug treatment.

The organization of the remainder of this report is as follows. Chapter Two describes the sampling procedures and the samples selected for DARP Cohorts 1 and 2. Chapter Three summarizes the gross results for each DARP modality on each criterion based on overall changes from Pre DARP to Post DARP, and also presents comparisons of outcome measures between DARP treatment groups adjusted for population differences. Chapters Four and Five focus on analyses of client characteristics and during-treatment factors associated with outcomes in the first year Post DARP, for each DARP treatment group separately. These analyses are based on a multiple regression algorithm to accomplish a step-down analysis of variance. Chapter Four describes the methodology and chapter Five, the results. Chapter Six presents a summary and integration of the overall results of the study, and their implications are discussed in chapter Seven.

CHAPTER TWO -- SAMPLING PROCEDURES

Admissions to drug abuse treatment programs in the DARP totaled 11,383 during June 1969 to May 1971 (Cohort 1), and 15,831 during June 1971 to May 1972 (Cohort 2). A stratified random sampling procedure was used to select followup samples from each of these cohorts, as described in detail by Simpson and Joe (1977). Samples were drawn to ensure appropriate representation with regard to DARP treatment classification, time in treatment, ethnic group, sex, age, and treatment agency or clinic. Within these general guidelines, the sampling strategy was determined by the availability of subgroups in the DARP population of sufficient size to enable analysis and generalization.

From Cohort 1, a total of 1853 DARP admissions was selected from 19 different treatment agencies; these included clients from methadone maintenance (MM), therapeutic communities (TC), outpatient detoxification (DT), and an intake only (IO) category defined as having completed DARP admission procedures but never returned to receive treatment. From Cohort 2, a total of 2254 DARP admissions was selected from 25 agencies, and included clients from outpatient drug-free treatments (DF) in addition to the MM, TC, DT, and IO groups.

Results of the Field Work for Locating Clients

Table 1 summarizes the followup status of the Cohort 1 and 2 samples, based on field work conducted during 1975 and 1976. Final disposition categories are shown according to DARP treatment classification for the two cohorts separately and combined. The results of the field work were generally similar for both cohorts. Overall, the figures for the two cohorts combined show that 86.8 percent of the DARP followup sample was located; 77.2 percent was interviewed, 5.5 percent was deceased, 1.2 percent was out of the country (usually due to military service), and 2.9 percent refused to be interviewed. The remaining 13.2 percent could not be located within the time allocated for this purpose.

The total number interviewed in the DARP followup sample was 3171, representing 1423 from Cohort 1 and 1748 from Cohort 2. At the time of interview, however, it was found that a small number of clients (14 in Cohort 1, and 26 in Cohort 2) had been erroneously reported as patients in the DARP; actually they had been admitted to the respective DARP treatment agencies for medical, alcohol, or psychiatric treatment. These persons were excluded from the followup study, leaving the final samples of 1409 for Cohort 1, 1722 for Cohort 2, and 3131 for both cohorts combined.

Sample Size by Treatment Type, Ethnic Group, and Sex

The numbers of interviewed clients in the combined Cohort 1 and 2 followup sample are presented in table 2 according to treatment type, ethnic group, and sex. The DARP treatment types represented include the Change Oriented (MM-CO) and Adaptive (MM-A) types of methadone maintenance, the Traditional (TC-T) and a combination of Short-Term and Modified (TC-ST&M) types of therapeutic community, the Change Oriented (DF-CO) and Adaptive (DF-A) types of outpatient drug free treatment, outpatient detoxification (DT), and the comparison group which completed intake procedures but no DARP treatment (IO). The definitions of these treatment classifications are discussed in detail by Cole and Watterson (1976) and are summarized in chapter Four of this report. (The IO group technically is not a DARP treatment group, although for convenience it is often referred to as such in the present report.)

Table 2 shows that only black and white males were sampled in all treatment classifications; a total of 1080 black males and 1098 white males was

Table 1

Followup Status for Clients in DARP Cohorts 1 and 2 Followup Samples, by DARP Treatment Classification

Final Disposition	Percentage by DARP Treatment Classification					Total	
	MM	TC	DF	DT	IO	N	%
Cohort 1							
Interviewed	78	77	-	73	71	1423[a]	76.8
Deceased	7	6	-	9	5	133	7.2
Out of Country	0	1	-	0	0	8	0.4
Refused	3	4	-	5	2	60	3.2
Not Located	12	12	-	13	22	229	12.4
No. of Persons	1056	527	0	150	120	1853	
Cohort 2							
Interviewed	79	79	75	72	80	1748[a]	77.6
Deceased	5	3	3	4	6	93	4.1
Out of Country	2	2	3	1	1	42	1.9
Refused	2	3	3	2	1	59	2.6
Not Located	12	13	16	21	11	312	13.8
No. of Persons	848	570	567	173	96	2254	
Cohorts 1 and 2 Combined							
Interviewed	78	78	75	73	75	3171[a]	77.2
Deceased	6	5	3	7	6	226	5.5
Out of Country	1	2	3	0	0	50	1.2
Refused	3	3	3	3	2	119	2.9
Not Located	12	12	16	17	17	541	13.2
No. of Persons	1904	1097	567	323	216	4107	

[a]Of these persons interviewed, 14 in Cohort 1 and 26 in Cohort 2 were excluded from the study for reasons described elsewhere, leaving a final combined sample of 3131.

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Table 2

Number of DARP Clients in Cohorts 1 and 2 Followup Sample, by Treatment Type, Ethnic Group, and Sex

	Methadone Maintenance		Therapeutic Community		Outpatient Drug Free		Outpatient Detoxification	Intake Only	
	MM-CO	MM-A	TC-T	TC-ST&M	DF-CO	DF-A	DT	IO	TOTAL
Black:									
Male	121	319	195	148	56	73	87	81	1080
Female	76	169	-	-	-	33	33	-	311
Total	197	488	195	148	56	106	120	81	1391
Puerto Rican:									
Male	146	-	-	-	-	-	-	-	146
Female	-	-	-	-	-	-	-	-	-
Total	146	-	-	-	-	-	-	-	146
Mex-Amer.:									
Male	-	184	-	-	-	-	-	-	184
Female	-	-	-	-	-	-	-	-	-
Total	-	184	-	-	-	-	-	-	184
White:									
Male	98	283	203	189	78	82	87	78	1098
Female	-	87	54	56	46	46	23	-	312
Total	98	370	257	245	124	128	110	78	1410
Grand Total	441	1042	452	393	180	234	230	159	3131

included, with subsamples of 56 to 319 persons in separate treatment subgroups. Black females were included in MM-CO, MM-A, DF-A, and DT, and white females were included in all treatment groups except MM-CO and IO. The sample sizes for females, however, were much smaller than for males, and totaled 311 for blacks and 312 for whites. The only other ethnic groups with sufficient representation in the DARP population to be included in the followup sample were Puerto Ricans males in MM-CO (N=146) and Mexican-American males in MM-A (N=184).

The sample structure summarized in table 2 has important implications for analysis of the followup data. In particular, comparisons between treatment groups must take into account the fact that some client groups are represented in some treatments but not in others; for example, black females, Puerto Rican males, and Mexican-American males are included in MM but not in TC. To the extent that client groups differ in regard to the various criterion measures examined, the results of certain group comparisons based on all clients combined could be confounded and misleading. Thus, the structure of the samples used in the DARP followup research played an important role in the design of the data analysis.

In the present study, the analytic objectives include comparisons of treatment groups and this requires comparability of the client groups represented in the treatments. As noted previously, black and white males were the only clients included in all treatment groups and, therefore, the analyses reported later in this paper were restricted to this group. Characteristics of the DARP sample of black and white males are therefore examined below.

Description of the Black-White Male Sample

Of the 1080 black males shown in table 2, 548 were from Cohort 1 and 532 were from Cohort 2. Of the 1098 white males, 541 were from Cohort 1 and 557 from Cohort 2 (see Simpson & Joe 1977 for more detailed breakdowns). Together, black and white males represented 2178 (or 70 percent) of the total of 3131 persons interviewed in the Cohort 1 and 2 samples. The samples for the DARP treatment groups included 821 in MM, 735 in TC, 289 in DF, 174 in DT, and 159 in IO.

Descriptions of the followup sample, by treatment group, are presented in table 3 with regard to ethnic group, age at admission to DARP, pretreatment drug use, days in DARP treatment, and type of termination. Each treatment group was almost evenly split between blacks and whites, but age varied between groups; the average age ranged from a low of 23 for DF to a high of 27 for MM. Drug use during the 2 months before DARP admission was categorized into Daily Opioids Only (not counting marihuana), Daily Opioid Plus Nonopioids (other than marihuana), Less-Than-Daily Opioids (with or without other drugs), Nonopioids Only, and No Use (no use or missing data due to pretreatment confinement in jail or a residential treatment facility). The MM sample consisted primarily of users of daily opioids (84 percent); the remaining 16 percent used less frequently or none at all and included persons who transferred to DARP agencies from other treatment programs or who were confined in a jail, hospital, or therapeutic community during the 2 months before DARP admission. The DT and IO samples also included large percentages of daily opioid users (80 percent and 70 percent, respectively), and had relatively low percentages using opioids less than daily or nonopioids only (7-15 percent in each group). The smallest percentage of daily opioid users (48 percent) and the highest percentage of nonopioid only users (25 percent) were in the DF sample. The TC sample fell in between the DF and MM samples in terms of the representation of daily opioid and nonopioid only groups.

Distributions of days in DARP treatment show that MM had the longest tenure in DARP with a total of 41 percent in treatment over 360 days; this

Table 3

Description of the Followup Sample of Black and White Males by DARP Treatment Classification

	DARP Treatment Classification					
	MM	TC	DF	DT	IO	TOTAL
Ethnic Group:						
% Black	53	47	45	50	51	50
% White	47	53	55	50	49	50
Age at DARP Adm:						
Mean Age	27	24	23	26	24	25
Std. Dev.	7.7	6.7	5.9	6.7	6.7	7.2
Pre DARP Drug Use:						
% Da Op Only	38	24	24	40	38	31
% Da Op Plus	46	37	24	40	32	39
% <Da Op	8	22	17	12	15	15
% Nonop Only	3	11	25	7	9	9
% No Use	5	6	10	1	6	6
Days in DARP Trt:						
% None	0	0	0	0	100	7
% 1-30	5	23	21	46	0	16
% 31-90	12	20	34	44	0	19
% 91-180	21	17	22	7	0	17
% 181-360	21	17	13	3	0	16
% 361-720	26	20	9	0	0	18
% >720	15	3	1	0	0	7
Type of Termination:						
% Completed Trt.	12	23	13	16	0	15
% Expelled or Quit	66	71	82	81	100	73
% Referred or Other	22	7	5	3	0	12
No. of Persons	821	735	289	174	159	2178

compared to only 23 percent in TC and 10 percent in DF. Average duration in DARP treatment, in descending order, was 190 days in MM, 103 in TC, 69 in DF, and only 29 in DT (the IO sample spent no time in treatment). These variations reflect general differences in treatment structure and tenure expectations between these basic treatment approaches. In relation to type of termination in DARP treatment, only 12 percent of MM clients completed treatment and 66 percent quit or were expelled without completion of treatment (the latter percentage includes a small number terminated as a result of protracted jail terms). In addition, 22 percent of the MM clients were categorized as "Referred or Other;" most of these clients were referred to other treatment programs (15 percent), some were still in treatment when recordkeeping in DARP ended in March 1974 and it was not possible to classify their final DARP termination status (5 percent), and a few terminated for other reasons such as extended hospitalization (2 percent). In the other DARP treatments, completions accounted for 23 percent of the sample in TC, 13 percent in DF, and 16 percent in DT. Persons who were expelled or quit accounted for 71 percent in TC, 82 percent in DF, and 81 percent in DT. Only 3-7 percent of the TC, DF, and DT samples were in the Referred or Other category.

CHAPTER THREE -- COMPARISON OF OUTCOMES BETWEEN DARP TREATMENT GROUPS

Interpretation of change on criterion measures from Pre DARP to Post DARP for different treatment groups is complicated by many factors which reflect the fact that assignments of clients to drug treatments were not random. Thus, different treatments generally involved different types of clients as well as different goals and expectations for treatment. To consider changes on criterion measures over time, therefore, these data must be examined separately for different treatment groups. Although such results do not explain the changes observed or identify factors related to change, they represent a necessary first step in the evaluation of treatment effects. The first section of this chapter summarizes the gross changes on several criterion measures from pretreatment baseline levels to the first year after clients left DARP. These results describe what actually occurred within each DARP treatment group, but do not provide a basis for meaningful comparisons <u>across</u> treatment groups.

There is much interest in the questions of whether and to what extent Post DARP outcomes were more favorable for some treatment groups than for others. As already noted, the treatment samples differed in many ways before treatment and it is appropriate that this be given consideration in comparing outcomes after treatment. Clients admitted to MM programs, for example, typically used opioid drugs daily before treatment, while outpatient drug-free clients typically showed much lower average use of opioid drugs. Comparisons of opioid use after DARP should therefore include analyses of these and other relevant differences. Such analyses are presented in the final section of this chapter.

<u>Gross Changes from Pre DARP to Post DARP Levels</u>

Evaluations of change from before to after DARP treatment are based on comparisons of group averages on several different criterion measures during

a Pre DARP "baseline" period and the first year following termination of DARP treatment. The baseline period represents the 2 months immediately before admission to DARP for most measures, although in some instances longer periods were used. When possible, a longer baseline period is generally preferable over the 2 months pretreatment since this is an acute period at the point of entry into treatment and is of shorter duration than the 12-month Post DARP period analyzed in this study. In most instances, however, information for the 2 months Pre DARP represented the only baseline data available.

The measures examined include opioid use, nonopioid use, marihuana use, alcohol use, employment, criminality indicators, and entry into other drug treatments. Tabulations of these measures for the Pre DARP and Post DARP periods have been adjusted to take into account whether or not the person was "at risk" during both time periods. For example, persons confined to a jail, hospital, or residential treatment facility in the 2 months before DARP were not considered "at risk" since they were not living in the community with normal access to illicit drugs, alcohol, and employment, and they were therefore excluded from baseline tabulations for these particular measures. Similar adjustments were also made for these measures due to restriction of time at risk during the Post DARP period; that is, persons with less than 3 months at risk in the year following DARP were excluded from the tabulations because of the extremely small amount of information available for calculating criterion scores. Altogether, 298 clients out of 2178 (13.7 percent) were excluded because they were not at risk for these measures either Pre- or Post DARP. Outcome measures for jail and drug treatment were not subject to the same limitations involving time at risk, although the measure of Post DARP arrest rate was applied only to persons with at least 3 months at risk in the first year after DARP. The potential biasing of the study sample resulting from these exclusions was examined in detail (see appendix A) and found to be minimal and nonsignificant.

Assessment of the statistical significance of changes in Pre DARP to Post DARP means on each separate criterion measure was based on a series of profile analyses (Morrison 1967) within each DARP treatment group (MM, TC, DF, DT, and IO). This analytic procedure is the multivariate equivalent of a traditional analysis of variance with repeated measures, and includes tests for trends or changes from one time period to another, differences between groups, and variations between trends of different groups. The results are summarized in table 4 and are also displayed graphically in figures 1, 2, and 3. The following discussion refers to the graphics, but all of the supporting data are presented numerically in table 4.

Opioid use. Figure 1 shows that the use of opioid drugs (measured on a 4-point scale, with 1 = no use, 2 = less-than-weekly use, 3 = weekly use, and 4 = daily use) declined dramatically from the 2 months Pre DARP to Post DARP, especially in the MM and TC groups. Pre DARP use of opioid drugs was highest for the MM and DT groups, which averaged almost daily use. The IO and TC groups were slightly lower, and the DF group was lowest. Average opioid use Post DARP dropped below less-than-weekly for MM, TC, and DF, but was somewhat higher for DT and IO.

The profile analysis indicated that the magnitude of change in average opioid use from Pre DARP to Post DARP was different between groups ($p<.01$) and that these groups should be further examined individually (using matched-sample t tests). Thus, comparisons of Pre DARP to Post DARP changes were analyzed within groups and the results showed that the decreases in use were statistically significant for each group ($p<.01$); the decreases were larger in the MM and TC groups, however, than in the DF, DT, and IO groups.

Nonopioid use. Figure 1 also shows that each of the DARP treatment groups decreased in average use of nonopioid drugs (measured on the same 4-point scale

Table 4

Comparison of Pre DARP and Post DARP (First Year) Means on Nine Criteria for Each DARP Treatment Group (Cohort 1-2 Black and White Males, N=2178)

	DARP Treatment Group				
	MM	TC	DF	DT	IO
Drug Use and Employment Measures					
Opioid Use:					
Pre DARP	3.69	3.26	2.64	3.63	3.44
Post DARP	1.92	1.88	1.86	2.66	2.46
Diff.	-1.77*	-1.38*	-.78*	-.97*	-.98*
Nonopioid Use:					
Pre DARP	1.91	2.23	2.13	2.04	2.04
Post DARP	1.48	1.53	1.54	1.87	1.77
Diff.	-.43*	-.70*	-.59*	-.17	-.27
Marihuana Use:					
Pre DARP	1.77	2.16	2.33	1.89	2.12
Post DARP	2.08	2.10	2.46	2.11	2.39
Diff.	+.31*	-.06	+.13	+.22	+.27
Alcohol Use:					
Pre DARP	1.34	1.37	1.43	1.37	1.25
Post DARP	1.62	1.62	1.45	1.62	1.49
Diff.	+.28*	+.25*	+.02	+.25*	+.24*
Any Employment:[a]					
Pre (2 mo.)	46	34	40	46	37
Pre (12 mo.)	68	68	66	73	68
Post DARP	68	76	72	61	56
Diff. (2 mo.)	+22	+42	+32	+13	+19
Diff. (12 mo.)	0	+8	+6	-12	-12
Months Employed:					
Pre (12 mo.)	4.80	3.84	4.20	4.92	3.84
Post DARP	6.72	6.96	6.36	5.16	4.80
Diff.	+1.92*	+3.12*	+2.16*	+.24	+.96
Sample Size:[b]	749	585	247	166	133 (N=1880)

Table 4 (Continued)

	DARP Treatment Group					
	MM	TC	DF	DT	IO	
Arrest Rate Measure						
Arrest Rate:						
Pre DARP[c]	.21	.24	.15	.17	.19	
Post DARP	.13	.19	.18	.24	.22	
Diff.	-.08*	-.05	-.03	+.07	+.03	
Sample Size:[b]	775	672	257	168	139	(N=2011)
Jail and Drug Treatment Measures						
Any Jail:[a]						
Pre DARP[c]	75	79	63	59	70	
Post DARP	23	29	30	35	34	
Diff.	-52	-50	-33	-24	-36	
Any Drug Trt.:[a]						
Pre DARP[c]	54	56	40	45	53	
Post DARP	39	26	22	43	41	
Diff.	-15	-30	-18	-2	-12	
Sample Size:	821	735	289	174	159	(N=2178)

[a]Significance tests were not computed for these measures.

[b]The sample used for each set of measures was limited to persons "at risk."

[c]Refers to lifetime prior to admission to DARP treatment.

*$p<.01$

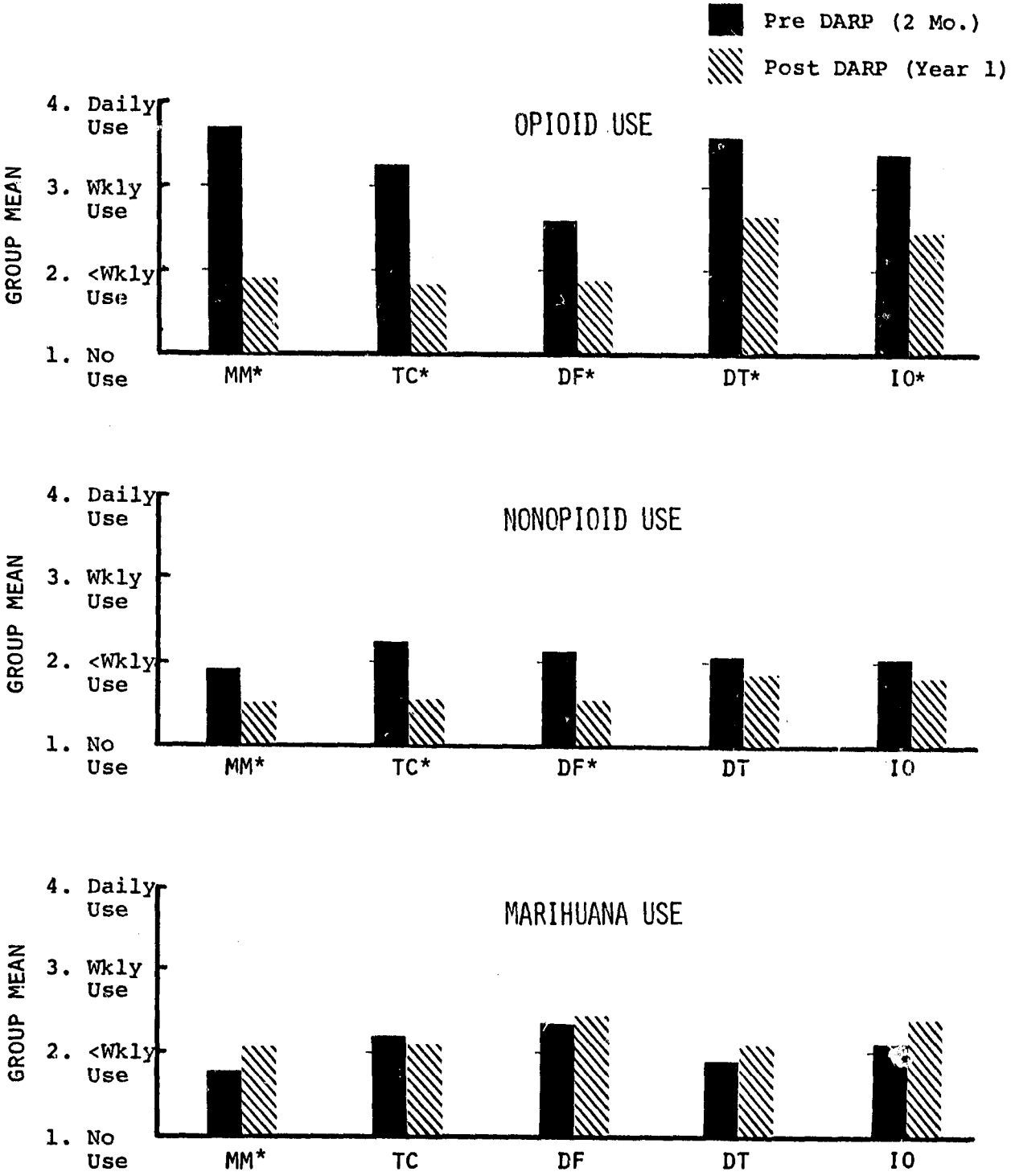

Figure 1. Illicit drug use before and after DARP treatment for each treatment group. (Asterisks denote groups with statistically significant changes, $p<.01$.)

of 1 = no use, 2 = less-than-weekly use, 3 = weekly use, and 4 = daily use) from before to after DARP. All but the MM group had an average Pre DARP usage level slightly higher than "less-than-weekly" and the Post DARP levels were lower. The magnitude of the changes was significantly different across groups and thus comparisons were made within groups. The results of these within group analyses showed that only the decreases for MM, TC, and DF were significant ($p<.01$), while those for DT and IO were not.

Marihuana use. As seen in figure 1, four of the five treatment groups (all but TC) showed an increase in marihuana use (measured on the 4-point scale of 1 = no use, 2 = less-than-weekly use, 3 = weekly use, and 4 = daily use) from Pre DARP to Post DARP, although the increase was relatively small in each group. The highest usage rates, both before and after DARP, were in the DF group, but the average usage level was near "less-than-weekly" for all groups. The magnitude of changes over these time periods was found to be different between groups, and separate analyses within groups showed that only the increase in MM was significant ($p<.01$). The Pre DARP to Post DARP differences in the TC, DF, DT, and IO groups were not significant.

Alcohol use. The results for average daily consumption are shown in figure 2. In this analysis, alcohol use was defined as the composite 80-proof liquor equivalent of beer, wine, and liquor use and was measured on a 3-point scale of 1 = 0.0 to 4.0 ounces per day, 2 = 4.1 to 8.0 ounces, and 3 = over 8.0 ounces. The overall level of alcohol use on this scale was low before and after DARP, although there was a Post DARP increase in all groups. The differences between groups in magnitude of change were significant and further analyses within groups showed that all group increases, except in DF, were statistically significant ($p<.01$).

Any employment. Figure 2 shows the percentage of each treatment group employed (part time or full time) during the 2 months before DARP, a full year before DARP, and the first year after DARP. For the 2-month baseline, the lowest employment rates were for TC (34 percent) and IO (37 percent), and the highest rates were for DT (46 percent) and MM (46 percent; DF was in between with 40 percent. For the 12-month baseline, all groups had highly similar percentages with any employment (i.e., 1 month or more); these were 66 percent for DF, 68 percent for MM, TC, and IO, and 73 percent for DT. The percentage of each group with any Post DARP employment (i.e., 1 month or more) increased slightly or stayed the same, compared to the 1-year Pre DARP baseline, for MM (68 percent), TC (76 percent), and DF (72 percent), but decreased for DT (61 percent) and IO (56 percent). Statistical analyses were not computed for these measures but were performed on the measure of months employed, discussed next.

Months employed. The average number of months employed part time or full time is shown in figure 2 for each group, based on the year before and year after DARP. The average amount of time employed before DARP was approximately 4 months in TC, DF, and IO, and near 5 months in MM and DT, which were also the two oldest groups. There was a general Post DARP increase on this measure, especially in TC (4 to 7 months), DF (4 to 6 months), and MM (5 to almost 7 months). The profile analysis showed significant between-group variations in the magnitude of change, and subsequent analyses for the groups considered separately indicated that only the increases in employment in MM, TC, and DF were statistically significant ($p<.01$).

Arrest rate. Arrest rate changes are shown in figure 3. The average number of arrests (with charges) was used as the basis for this measure, although it was converted to a rate per year. The Pre DARP baseline measure was derived from the total number of arrests that each person had before DARP (i.e., lifetime baseline); this number was then divided by the number of years between age 12 and age at admission to DARP (excluding any time in jail or

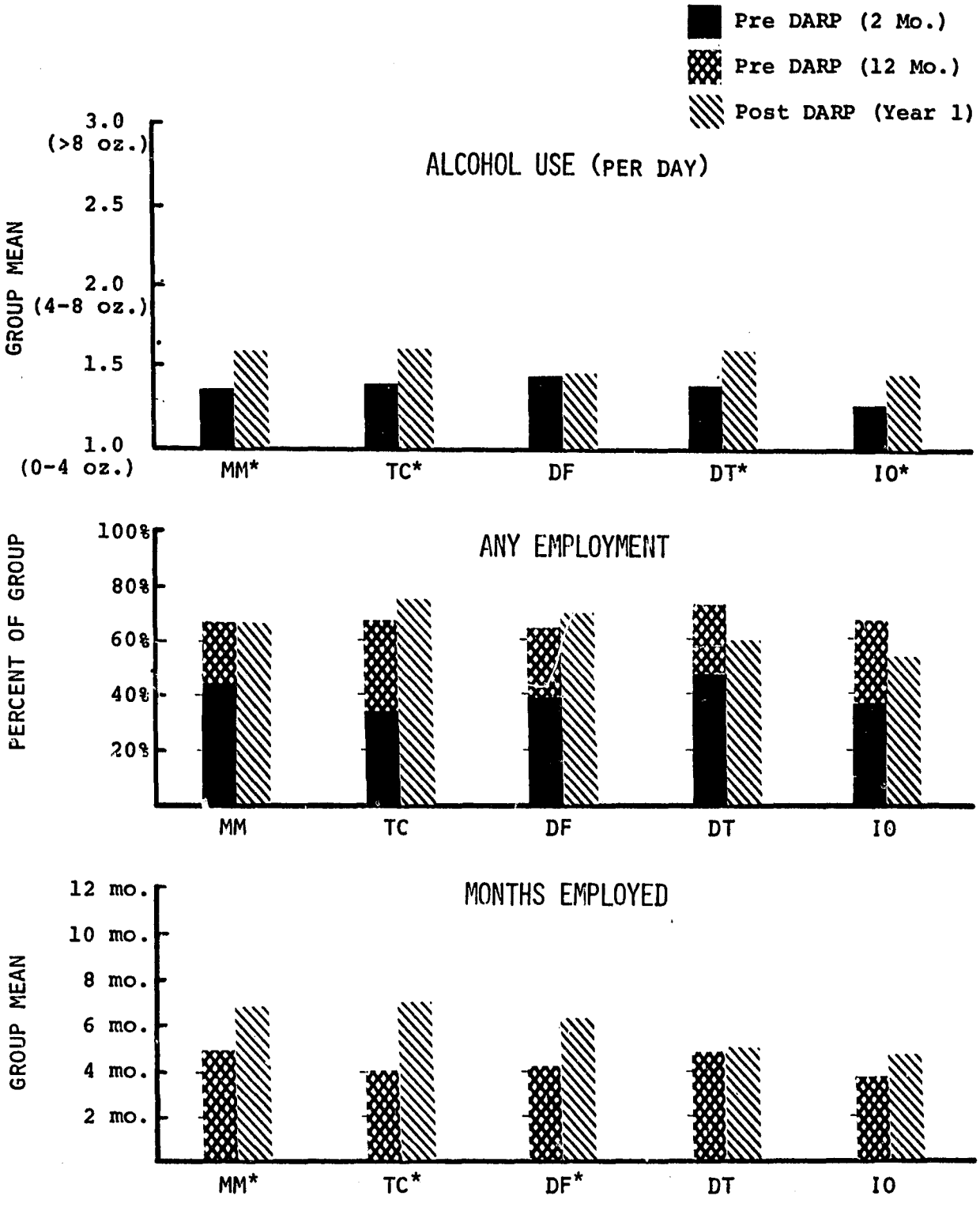

Figure 2. Alcohol use and employment before and after DARP treatment for each treatment group. (Asterisks denote groups with statistically significant changes, $p<.01$.)

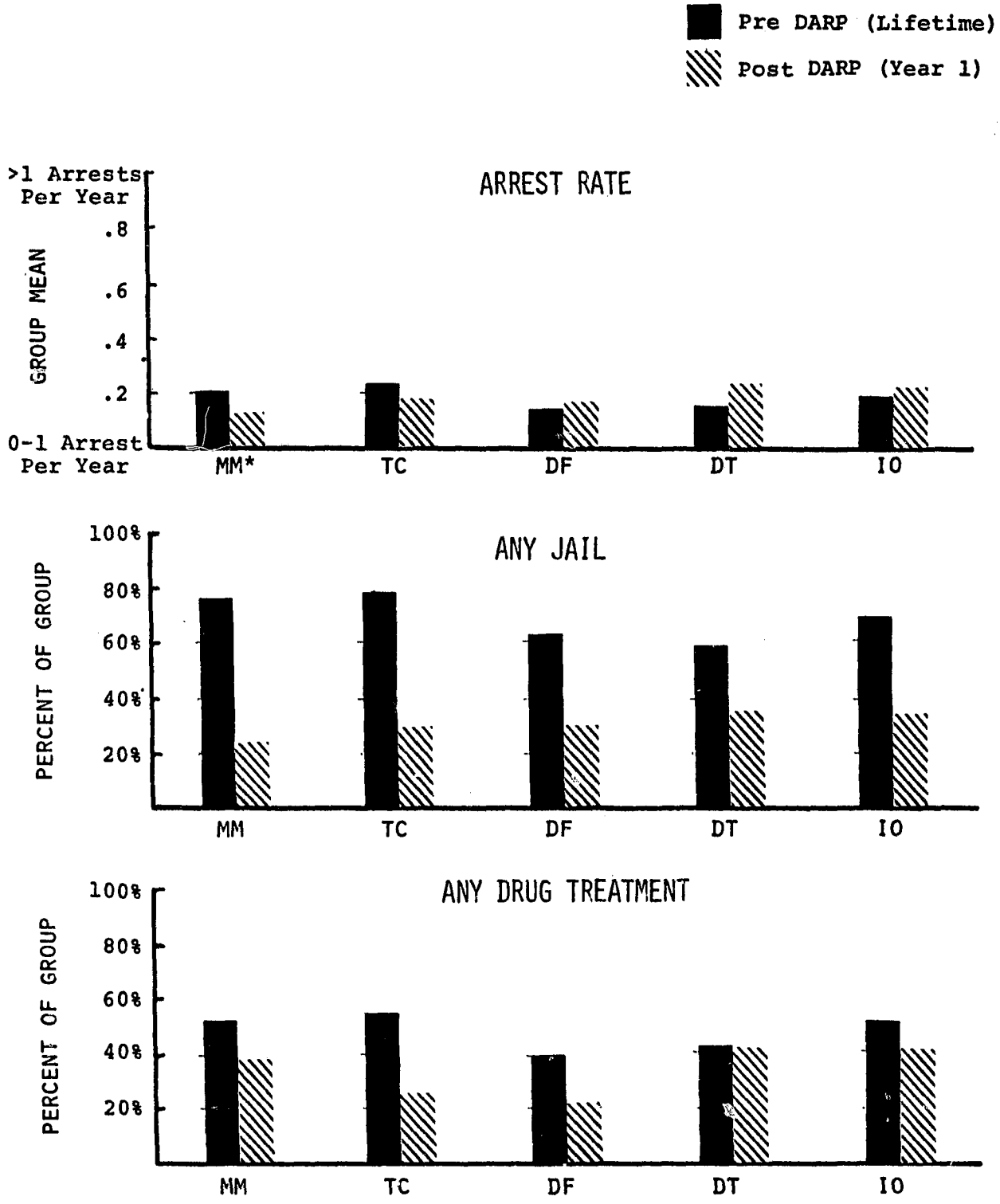

Figure 3. Criminality indicators and drug treatments before and after DARP treatment for each treatment group. (Asterisks denote groups with statistically significant changes, $p<.01$.)

prison) in order to obtain an estimate of the average arrests per year while the person was "at risk" (see Demaree & Neman 1976 for more discussion on this measure). The arrest rate Post DARP was based on the first year after DARP. Measures of arrest rate were then dichotomized in a manner that made Pre DARP and Post DARP rates comparable; the scoring used was (0) no more than one arrest per year, and (1) over one arrest per year.

As seen in figure 3, scores on arrest rates decreased after DARP in the MM and TC groups, but increased in DF, DT, and IO. Results to the Pre DARP to Post DARP comparisons within groups showed that only the decrease in the arrest rate in MM was significant ($p<.01$); the changes in other groups were not statistically significant.

Any jail. The percentage of each group ever arrested and jailed before (lifetime measure) and after DARP is illustrated in figure 3. Since the Pre DARP baseline is a lifetime figure and not represented on the same unit of time as Post DARP (i.e., 1 year), direct comparisons of these data across time periods were not appropriate and these data were not analyzed statistically. The TC and MM groups had the highest percentages of persons ever incarcerated before DARP (79 percent and 75 percent, respectively), but the lowest after DARP (29 percent and 23 percent, respectively). The corresponding percentage changes for the other groups were 63-30 percent in DF, 59-35 percent in DT, and 70-34 percent in IO.

Any drug treatment. The percentages of each group ever in other drug treatments before (lifetime measure)[1] and after DARP are shown in figure 3. As also noted with regard to jail, the Pre DARP baseline for drug treatment was a lifetime measure and therefore not subject to direct comparison with the 1-year Post DARP measure because of the different lengths of time involved. The percentage ever treated before DARP was lowest in DF (40 percent) and highest in TC (56 percent); DT (45 percent), IO (53 percent) and MM (54 percent) were in between. After DARP, the lowest percentages treated were in DF (22 percent) and TC (26 percent), while MM (39 percent), IO (41 percent), and DT (43 percent) were higher. The percentages of persons treated Post DARP were about half of what they were Pre DARP in the drug free TC and DF groups. The differences were smaller in the MM and IO groups, and near zero in the DT group.

Summary. Favorable changes were observed on most of the criterion measures from Pre DARP baselines to the first year Post DARP, especially among persons in the major DARP treatment modalities MM, TC, and DF. All three groups showed significant reductions in opioid and nonopioid use as well as increased employment from Pre DARP to Post DARP. Arrest rate scores also decreased after DARP for the MM and TC groups, although the decrease was statistically significant only for MM. By contrast, none of the Pre DARP to Post DARP changes was significant for the DT and IO groups, with one exception. The exception was on opioid use, which did decrease significantly from Pre DARP levels in the DT and IO groups; however, these changes were smaller than those in the MM and TC groups. Although most of the Pre- to Post DARP changes observed were considered favorable in terms of treatment goals, there were some relatively small increases in the use of marihuana and alcohol. The increase in marihuana use was significant only in MM, and in alcohol use, in all groups except DF (see Simpson & Lloyd 1977 for further discussion of alcohol and illicit drug use in the Cohort 1 followup sample).

Return to drug treatment during the first year after DARP was highest in the DT, IO, and MM groups, whose reentry rates were 43 percent, 41 percent, and 39 percent, respectively, and lowest in DF (25 percent) and TC (27 percent). Return to treatment is very important not only as a posttreatment outcome variable, but also because of the expected impact of treatment status

on other outcome measures. For example, the outcome measures included in the preceding analyses of gross results were not "adjusted" to take into account time spent in outpatient treatment during the first year after DARP. Data representing time during which an individual was restricted in residential TC treatment, hospital, or jail were excluded in the calculation of criterion scores, as explained earlier. This procedure was followed in the initial analysis of gross results even though it has been shown that drug use and criminality (and in some cases, employment) are to some extent affected by drug treatment status. Drug use and criminal activity were observed to be reduced following entry into DARP treatment (Spiegel & Sells 1974; Gorsuch, Abbamonte, & Sells 1976; Gorsuch, Butler, & Sells 1976) and following entry into Post DARP treatment (Savage & Simpson 1977). It is believed that failure to take Post DARP treatment into account resulted in more favorable Post DARP measures, but the extent to which this actually occurred was difficult to predict.

To the extent that Post DARP treatment status effects operated in the present data, it was expected that the effects would be greatest in the DARP MM group (based on previous research) as well as in the DARP DT and IO groups since they included the highest percentages of persons with Post DARP treatment. Thus, the two groups that have already shown the most unfavorable Post DARP outcomes (i.e., DT and IO) would be expected to have appeared even more unfavorably if adjustments had been made for time in Post DARP treatment. By the same logic, the relatively favorable Post DARP outcomes of the MM group would have been adversely affected to some extent by such adjustments. The overall negative Post DARP outcomes of the DARP DT and IO groups would not be expected to improve by an adjustment for time in treatment, and they might become even more negative in comparison to other groups (such as TC and DF).

To assess the effects of Post DARP treatment on other outcome measures included in this study, the followup sample was examined with respect to time spent in treatment during the first year after DARP. It was found that of the sample for whom outcome criteria were computed (i.e., persons with at least 3 months at risk), 25 percent had spent one-third or more of their time (excluding months in a jail or hospital) in treatment during the first Post DARP year; for the separate DARP treatment groups, there were 34 percent in MM, 19 percent in TC, 16 percent in DF, 25 percent in DT, and 26 percent in IO. Thus, these individuals were in treatment at least 1 out of every 3 months during this time and would be the ones most affected by an adjustment for time in treatment. The outcome data were reexamined after excluding these persons from the sample and the results remained essentially the same even though some of the expected changes in outcomes were observed. Thus, adjustment of the gross results presented above by removal of individuals with considerable time in Post DARP treatments did not significantly change the nature of these results.

The relative differences represented in the changes from Pre DARP to Post DARP and the general level of the Post DARP measures typically favored the MM, TC, and DF groups over the DT and IO groups. However, comparisons of the raw difference scores did not take into account variations on baseline and other factors that are known to differentiate the treatment groups. These are addressed in the remainder of this chapter.

Comparisons of Post DARP Outcomes Across Treatment Groups

This section reports a further study of Post DARP outcome measures, focusing on differences between treatment groups by a procedure that makes statistical adjustments to the Post DARP measures based on pretreatment information. By controlling for variations among patients in the five treatment groups on variables reflecting their status prior to and at entry into treatment, comparisons were possible with respect to the posttreatment outcome measures that

could be interpreted as indicating a main effect of treatment for the groups compared.

The analytic technique used was analysis of covariance (ANCOVA). In this analysis, selected Pre DARP variables served as covariates and DARP treatment group (MM, TC, DF, DT, and IO) was the factor evaluated. The analysis was conducted separately for each of nine outcome measures, as defined in table 5. The covariates included ethnic group, age, factor scores of background characteristics, previous treatments, and factor scores representing Pre DARP baseline variables. The factor scores representing background and Pre DARP baseline variables were derived from principal components analyses, described later in chapter Four. The ethnic group, age, and previous treatment variables are also defined in chapter Four.

The effect of the analytic procedure employed was to adjust each outcome measure by an amount equal to the variance that was linearly associated with the set of covariates. ANCOVA, therefore, evaluates differences between the treatment groups based on this adjusted outcome measure. (The intercorrelations among the covariates were generally low; the full set of covariate intercorrelations is shown in table B-1 of appendix B.) The covariance adjustments to the outcome criteria generally were not large, and accounted for only 2-9 percent of the variance of the individual criteria. A general methodological discussion of ANCOVA, including its applicability to the present data, is found in appendix C.[2]

The means of the raw scores as well as the adjusted scores for each of the nine outcome measures are presented in table 6, by DARP treatment group. The largest adjustments were made to the outcome measures for the MM and DF groups. It will be recalled from table 3 that these two treatment groups were the most widely separated of all the groups in terms of ethnic group, age, and Pre DARP drug use. It is also noted that the samples used in these analyses are in some cases reduced from their original number. In accordance with the standard procedure described earlier concerning time "at risk", Post DARP scores on illicit drug use (opioid, nonopioid, and marihuana), alcohol use, and employment were computed only for months during which the persons followed were not confined (in jail or residential/inpatient treatment facility) and persons with less than 3 months at risk were excluded; these restrictions, however, did not apply to Post DARP measures for jail and return to treatment. In addition, in order to conform with the requirements of the computational program, it was necessary to have complete data on all individuals included in the analysis for each outcome measure. The numbers of persons included in the analyses, as shown in table 6, reflect these exclusions based on time at risk Post DARP (first year) as well as missing data on one or more of the predictor variables used as covariates. Although the number of exclusions required by these analyses was relatively large in some instances (e.g., approximately 25 percent of the original TC and DF samples were excluded in the analyses of drug use and employment measures), bias resulting from these adjustments was found to be minimal and not significant. Appendix A discusses these findings in more detail.

The adjusted mean scores for Post DARP outcomes of the five treatment groups are shown graphically in figure 4. These scores incorporate "corrections" for pretreatment factors and are most properly interpreted in terms of the relative differences between groups, not absolute magnitudes. The ANCOVA results, summarized in table 7, indicated that mean group differences and covariate adjustments were highly significant ($p<.01$) for all measures except Post DARP alcohol use; alcohol use therefore is not included in figure 4.

Table 5

Definition of Outcome Measures

Outcome Measure	Definition of Scores
Opioid Use, Nonopioid Use, and Marihuana Use:	1 = No use 2 = Weekly use 3 = Less-than-weekly use 4 = Daily use
Alcohol Use: (80-proof equivalent)	1 = No use 2 = 0.1 to 4.0 oz. per day 3 = 4.1 to 8.0 oz. per day 4 = Over 8.0 oz. per day
Employment: (% of months employed while "at risk")	0 = No employment 1 = 1 to 67% of months at risk 2 = Over 67% of months at risk
Any Jail: (Arrested and jailed over 72 hours)	0 = No jail episodes 1 = 1 or more jail episodes
Any Treatment: (Any type of drug treatment)	0 = No drug treatment episodes 1 = 1 or more drug treatment episodes
Months in Treatment: (Months in any type of drug treatment)	0 to 12 = number of months in which any drug treatment was received
Months Unsupervised: (Months without any jail or treatment supervision)	0 to 12 = number of months in which no jail or drug treatment was reported

Table 6

Mean Scores on Post DARP Outcome Measures for Treatment Groups Before and After Adjustments Resulting from the Analysis of Covariance for Group Comparisons

Outcome Measures for Year 1 Post DARP	Mean Scores, by DARP Treatment Group				
	MM	TC	DF	DT	IO
Sample With 3 Months or More "At Risk" (N=1790)					
Opioid Use:					
Unadjusted	1.92	1.88	1.86	2.66	2.46
Adjusted	1.88	1.87	2.02	2.67	2.46
Nonopioid Use:					
Unadjusted	1.48	1.53	1.54	1.87	1.77
Adjusted	1.52	1.48	1.51	1.90	1.76
Marihuana Use:					
Unadjusted	2.08	2.10	2.46	2.11	2.39
Adjusted	2.20	2.01	2.30	2.14	2.35
Alcohol Use:					
Unadjusted	1.54	1.66	1.29	1.39	1.17
Adjusted	1.53	1.67	1.26	1.40	1.18
Employment:					
Unadjusted	1.19	1.27	1.18	.91	.89
Adjusted	1.18	1.30	1.13	.88	.92
No. of Persons	736	563	217	148	126
Total Sample (N=1908)					
Any Jail:					
Unadjusted	.231	.286	.303	.353	.343
Adjusted	.224	.271	.357	.370	.337
Any Treatment:					
Unadjusted	.394	.261	.223	.431	.406
Adjusted	.367	.271	.245	.422	.408
Months in Trt:					
Unadjusted	3.24	1.38	1.18	2.31	2.08
Adjusted	3.17	1.42	1.34	2.23	2.12
Months Unsupervised:					
Unadjusted	7.70	9.08	9.13	8.50	7.85
Adjusted	7.89	9.08	8.54	8.48	7.82
No. of Persons	769	605	238	153	143

Note. Persons with missing data on any covariate or outcome measure were excluded.

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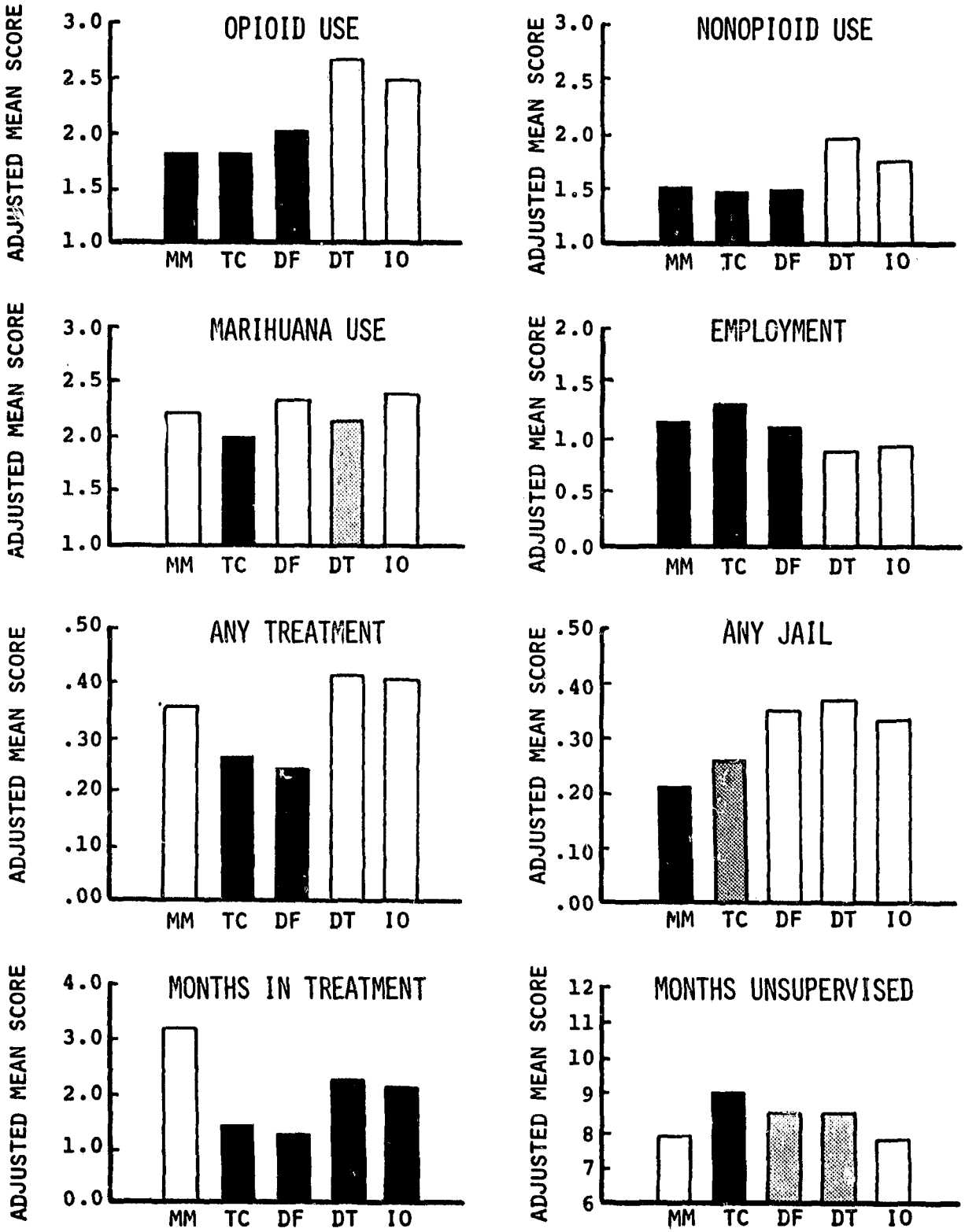

Figure 4. Relative standings on adjusted Post DARP outcome measures for DARP treatment groups. (Groups with the black and white shadings were significantly different from one another, $p<.01$, while groups with gray shading did not differ significantly from any other group.)

Table 7

Summary of Results for Analysis of Covariance for Comparing DARP Treatment Groups on Outcome Measures During the First Year After Leaving DARP

Outcome Measures for Year 1 Post DARP	F-ratios and Significance Levels: Treatment Groups	Covariates
Sample With 3 Months or More "At Risk"		
Opioid Use	22.14*	12.37*
Nonopioid Use	9.19*	9.58*
Marihuana Use	4.49*	17.86*
Alcohol Use	.90	.64
Employment	10.75*	14.91*
Degrees of Freedom	(4,1776)	(9,1776)
Total Sample		
Any Jail	6.87*	14.05*
Any Treatment	8.96*	12.02*
Months in Trt.	19.28*	12.77*
Months Unsupervised	6.33*	15.47*
Degrees of Freedom	(4,1894)	(9,1894)

*p<.01

Paired comparisons between the treatment groups were also made on each criterion measure and the results were used to determine significant differences among the specific groups. The groups that differed significantly ($p<.01$) are noted for each measure in figure 4 by the use of different shadings of the bar graphs; the groups with the black and white shadings were significantly different from one another, while the group with gray shading did not differ significantly from any other group. Thus, the black columns denote the most favorable outcome groups, the white columns denote the most unfavorable outcome groups, and the gray columns dencte intermediate outcome groups. The results for each criterion measure are described below.

Drug use. Group comparisons involving opioid and nonopioid drug use during the first year after DARP showed the same results, namely, that usage was significantly higher in the DT and IO groups than in the MM, TC, or DF groups. Differences between MM, TC, and DF and between DT and IO were not significant. Marihuana use was lowest for the TC group and highest for the MM, DF, and IO groups. Alcohol consumption (not shown in figure 4) was not significantly different between the groups.

Employment. Scores on employment (representing a scaled value of the percentage of time employed, as defined previously in table 5) were lowest for DT and IO, and highest for TC, MM, and DF. Employment scores were slightly higher for the TC group than for MM and DF, although the differences were not significant; however, tabulations on type of employment in the first year Post DARP revealed that 8 percent of the TC group reported that the only jobs held were treatment related (such as drug counselors), compared to 1 percent in MM and DF, and none in DT and IO. Adjustments to employment measures to reflect only jobs not related to treatment would result in virtually identical Post DARP employment rates for MM, TC, and DF, but they would not change the overall pattern of results.

Jail. Incidence of Post DARP incarcerations (3 days or more) was lowest for the MM group, and significantly higher for the DF, DT, and IO groups. TC was in between and not significantly different from any other group. (Distributions of arrest rate scores were highly skewed and therefore not analyzed using ANCOVA.)

Post DARP drug treatments. The TC and DF groups had the lowest scores representing any return to drug treatment in the first year after DARP. The highest scores on return to treatment were for DT, IO, and MM. The MM group had a slightly lower score on return to treatment than DT and IO, but on months in treatment the MM group had higher tenure than the DT and IO groups (as well as TC and DF). The DT and IO groups had higher tenure in Post DARP treatments than TC or DF, but these differences were short of statistical significance. Although not illustrated in figure 4, further analysis of months in treatment indicated that of the 39 percent in the DARP MM group who returned to Post DARP treatment, approximately two-fifths were in treatment all 12 months (compared to approximately one-fifth in each of the other groups) and their average stay in treatment was 8.2 months (compared to 5.3 to 6.1 months in the other groups).

Thus, even though the DT and IO groups had a slightly higher rate of return to treatment after DARP, the MM group was the most likely of any group to stay in treatment the longest. In this connection it is of interest that some of the DARP followup sample (particularly in MM) continued in treatment after DARP, sometimes as a result of a formal referral to another program by a DARP agency. Also, DARP MM clients were more likely to return to MM programs, which in turn had higher average tenure rates than TC, DF, and DT programs. Together, these factors probably account in part for the longer average duration of Post DARP treatments among the MM group.

Months unsupervised. In the interest of evaluating a general index of time unsupervised, a measure was created for the followup sample to represent the degree to which each person's life was free of formal societal intervention during the first year after DARP. Time in jail and in drug treatment were used to define periods of societal supervision for this measure, although it was recognized that other factors, not recorded in the followup interview, could also be included as part of this definition (such as time on legal parole or probation). Group comparisons for this measure indicated that the TC group had the highest score for unsupervised months, while the MM and IO groups had the lowest score. The DF and DT groups were in between (but not significantly different from) the highest and lowest groups. The low score of the MM group deserves special mention in view of the importance of time spent in Post DARP treatments in the computation of months unsupervised; the MM group had the lowest score of any group with respect to entry into jail, but their high Post DARP treatment tenure was a major factor in this group's position on the measure representing months in the community without supervision.

Summary. The comparative analysis of posttreatment outcomes for the first Post DARP year showed favorable results for the three major treatment modalities, MM, TC, and DF, and relatively unfavorable results for the short-term outpatient detoxification modality, DT, and the DARP intake only group, IO. This comparison stood up even when Post DARP means were adjusted for population and Pre DARP baseline differences among the five groups compared. In this analysis, TC received favorable marks on seven of the eight criteria for which significant group differences were found, and IO received unfavorable marks on seven of the eight. MM, TC, and DF had consistently and significantly more favorable outcomes than DT and IO on illicit drug use, both opioid and nonopioid, and on employment. MM excelled on the criminality indicator (based on any jail) while the drug-free modalities, TC and DF, had fewest who returned to treatment during the first year after DARP.

CHAPTER FOUR -- METHODOLOGY FOR THE ANALYSES WITHIN TREATMENT GROUP

The results presented in the preceding chapter indicated general improvement of clients from pretreatment baseline levels to the first year after DARP on most of the measures examined. In general, the outcomes of the DARP MM, TC, and DF treatment groups appeared most favorable, although there were differences among these groups on different criteria. These results were interpreted as indicating a main effect of treatment in the groups examined, but did not identify the differential contributions of the client characteristics, baseline levels, or other factors to the adjustments made on Post DARP means. They also did not take into account information on During DARP performance. The latter could not be done since the During DARP measures for DT were restricted and there were none for IO; in addition, the During DARP performance factors were not comparable across MM, TC, and DF.

Further analysis to assess the contributions of client demographic and background characteristics, baseline levels on the outcome criteria, and During DARP performance indicators (in the MM, TC, and DF groups) to Post DARP outcomes was indicated within the five treatment subsamples. This chapter describes the methodology employed for separate multiple regression analyses of the MM, TC, DF, DT, and IO groups using the analytic model

described below. It also provides information concerning the construction of factor scores for client background and baseline levels, as well as a description of other control variables employed in the ANCOVA study already reported in chapter Three.

The analytic model employed in this part of the research involves hierarchical multiple regression in which an outcome criterion serves as the dependent variable while the client demographic, background, and baseline criterion variables, as well as treatment type and during-treatment performance measures, are the independent (predictor) variables. In this model, the independent variables are entered in a fixed order representing their chronological order of existence and their sequential importance in the treatment process. For example, ethnic group and age (at DARP admission) are entered ahead of all other variables since they precede them in the life experience of the clients; background factors precede previous treatment and baseline factors, and so on.

A detailed description of the multiple regression model and its application to the present data is presented in the first section of this chapter. The predictor variables used in the regression analyses are presented in the following two sections, including a full listing and definition of the independent variables and a discussion of the procedures used to construct factor scores for representing background, Pre DARP baseline, and During DARP performance variables. The fourth section describes the dependent, Post DARP outcome measures.

Analytic Model for the Hierarchical Multiple Regression

A schematic summary of the analytic model is presented in table 8 which identifies the independent (predictor) variables and shows their order of entry in the regression analyses. As indicated in the table, DARP Treatment Classification (Treatment Type) and During DARP Performance measures were generally not applicable to the DARP DT and IO groups, and the regression analyses for these groups were limited to the variables shown in table 8. The predictor variables listed, along with the outcome measures to which they were applied in the analyses, are defined later in this chapter.

The regression model used in the present study is hierarchical in that the predictor variables are entered into the analyses in a predetermined order. Only main effects of these variables are included in the present model, but interactions could be added to the hierarchy using a similar strategy. In this model, variables at each step are evaluated after the influence of earlier variables in the predictor hierarchy are taken into account. The measure used to judge the importance of each successive predictor is the increment to the squared multiple correlation. This measure (ΔR^2) represents the increase in the proportion of variance predicted over the amount of variance already accounted for by variables previously entered into the prediction equation (i.e., at earlier steps in the hierarchy). For example, ΔR^2 for DARP treatment type (the tenth variable entered for the MM, TC, and DF treatment groups as shown in table 8) would indicate the proportion of the criterion variance that the type of DARP treatment accounted for, over and above the cumulative variance already accounted for by Demographic, Background, Previous Treatment, and Pre DARP Baseline variables, which were entered earlier. The statistical tests of the magnitude of ΔR^2 therefore assess the incremental predictive power of each variable after the (linear) effects of variables earlier in the hierarchy have been removed. Variables with significant ΔR^2 ($p<.01$) were considered to play an important role in predicting the criterion, and only their relationships with the criteria are interpreted.

It should be noted that this method of analysis is similar to an analysis of covariance (ANCOVA) in which any particular variable is treated as a factor (in a one-way ANCOVA) and all variables earlier in the hierarchy are treated

Table 8

Summary of the Model Used for Hierarchical Regression Analyses of Post DARP Outcome Criteria for Each DARP Treatment Group

Predictor Variables	Order of Entry for Predictors Used in the Analysis of Each DARP Treatment Group				
	MM	TC	DF	DT	IO
Demographic Variables:					
Ethnic Group	1	1	1	1	1
Age at Admission	2	2	2	2	2
Background Factors:					
Criminality	3	3	3	3	3
Socioeconomic Status	4	4	4	4	4
Social Responsibility	5	5	5	5	5
History of Previous Treatment:					
Chemical (MM or DT)	6	6	6	6	6
Non-Chemical (TC or DF)	7	7	7	7	7
Pre DARP Baseline Factors:					
Nonopioid Use	8	8	8	8	8
Street Addiction	9	9	9	9	9
DARP Treatment Classification:					
Treatment Type within Modality	10	10	10	--[b]	--
During DARP Performance:					
Social Deviance[a]	11	11	12	--	--
Alcohol-Marihuana Use[a]	12	12	11	--	--
Days in Treatment	13	13	13	10	--
Type of Termination	14	14	14	11	--

[a]These During DARP performance measures are factor scores defined separately for MM, TC, and DF (they were not applicable for the DT and IO groups), and their definitions are slightly different across these three groups. For DF, these factors are actually reversed in order and are labeled Nonopioid-Alcohol Use and Social Deviance.

[b]These predictor variables were not applicable for the treatment group analysis; in DT, only one type of treatment was included and it involved such short treatment tenure that performance measures generally were not available; the IO group had no treatment in DARP.

as covariates. Overall and Spiegel (1969) have described this analytic model as a step-down analysis of variance (Method 3) in which a logical a priori ordering of hypotheses about the independent factors and the interactions is established, and the effect of each factor is tested after adjustment for the other factors of a higher logical priority. The step-down method is most appropriate when (as in the present study) there are substantial intercorrelations among the predictors (or independent variables) and there exists a logical a priori ordering among the hypotheses to be tested.

In addition to ΔR^2, two other measures are also used to interpret the results of the hierarchical regression analyses in the present study. One is the zero-order correlation (r) between each predictor and the criterion. This product-moment correlation is a measure of the degree of linear association between each predictor and the criterion without any statistical adjustments for other variables. The other measure included is the standardized regression coefficient (β), which reflects the relative contribution to the prediction equation of each predictor variable after all the predictor variables have entered the analysis. The β weights of the final solution ignore the sequential ordering imposed by the hierarchical model and indicate the relative contribution that would have been made by each predictor had it been the last variable to enter the analysis. The use of ΔR^2 to evaluate the importance of each predictor in a hierarchical regression analysis involves an adjustment for variance associated only with variables earlier in the hierarchical order, while the use of β involves an adjustment for variance associated with all the other predictors (even those later in the hierarchical order). The tables in chapter Five that summarize the regression results include all three of these measures (ΔR^2, r, and β).

Definition of Demographic, Previous Treatment, and DARP Treatment Type Predictor Variables

Pre DARP and During DARP measures for clients included in the DARP follow-up research were obtained from the Admission Record, essentially a client history completed in an interview by agency personnel at the time of admission to DARP treatment, and the Status Evaluation Record, a bimonthly report on treatment delivered by the agency and client behaviors during each 2-month report period throughout treatment. The Status Evaluation Records were continued up to the time that each client left the DARP treatment program. (See Sells 1976 for copies of these report forms.)

Several of the predictor variables used in the regression analyses were defined directly from items in the Admission and Status Evaluation Records. They include demographic characteristics, treatment history, and DARP treatment classification variables, as described below.

Demographic Characteristics

Sex, age at DARP admission, and race-ethnic status of the client were obtained directly from the Admission Record. In the present study, only black and white males were included. For the purposes of analysis, the ethnic group variable was coded dichotomously (0 = white and 1 = black) and age was grouped into seven ordinal categories determined on the basis of distributional characteristics of the total DARP population, as follows: (1) under 18, (2) 18-20, (3) 21-22, (4) 23-25, (5) 26-30, (6) 31-40, and (7) over 40.

Treatment History

The total number of previous treatment episodes was recorded on the DARP Admission Record, but type and duration of treatment experience were not reported. Additional information was obtained in the DARP followup interview in order to describe treatment histories more fully in terms of time, duration, and types of treatment received before DARP. The measures developed

for Pre DARP treatment were therefore based on the followup interview. They indicated whether clients had ever received Chemical treatments or Non-Chemical treatments prior to entering DARP treatment. Chemical treatment was defined as methadone maintenance or detoxification, while non-chemical treatment referred to drug-free programs, including therapeutic communities as well as outpatient clinics.

DARP Treatment Classification

Classification of clients with regard to type of treatment received was based on the DARP treatment classification developed by Cole and Watterson (1976). This was carried out in a multistage procedure in which agency programs were classified by treatment type on the basis of site visit interviews conducted with treatment personnel at each agency. On the basis of this information, individual clients were subsequently classified according to their participation in these types as evidenced in their Status Evaluation Records. Types of treatment provided by the DARP agencies fell into four major modalities: Methadone Maintenance, Therapeutic Community, Outpatient Drug Free, and Detoxification. The treatment types defined within these major modalities are summarized below.

Methadone maintenance. These treatments involve the substitution of prescribed methadone for illicit opioid drugs for periods of time exceeding 21 days. Two subtypes of treatment were defined and were characterized as Adaptive (MM-A) and Change Oriented (MM-CO). Type MM-A generally regarded drug abstinence as a long-term, idealistic goal of treatment but stressed the importance of recognizing and adapting treatment to the individual needs of the client in order to develop trust and the ability to cope with the environment. Treatment schedules reflected minimum structure and low demand characteristics and were designed to be supportive in nature. Type MM-CO tended to emphasize the goal of eventual abstinence from drugs and the need for resocializing clients. Treatment schedules in this type typically were rigidly structured and involved a high level of intervention concerning client activities. For analysis of the MM subsample, the treatment type variable was coded dichotomously (0 = MM-CO, and 1 = MM-A).

Therapeutic community. Treatments of this type were located in a residential facility and were founded on a therapy process which involved highly structured and demanding social relationships, with clients frequently functioning as therapeutic change agents. Three subtypes of treatment were identified in therapeutic community settings, identified as Traditional (TC-T), Modified (TC-M), and Short-Term (TC-ST). In contrast to the overriding emphasis on "resocialization" in Type TC-T, the goals tended to be more problem-oriented in Type TC-M with a specific focus on the attainment of a drug-free state of clients and also on training for practical skills. In many respects, the modified therapeutic community goals embraced by TC-M also applied to TC-ST, but in the latter case there was also an emphasis on the short-term nature of the treatment (generally 3 to 6 months in duration). In the DARP followup studies, the samples selected from TC-M and TC-ST were not large enough to be retained as separate treatment types in the analyses and these two subsamples were combined into a single group, referred to as TC-ST&M. For analysis of the TC subsample, the treatment type variables was coded dichotomously (0 = TC-ST&M, and 1 = TC-T).

Outpatient drug-free treatment. Treatment in this modality offered outpatient services and emphasized abstinence from both licit and illicit drugs. Two subtypes, defined as Adaptive (DF-A) and Change Oriented (DF-CO), were identified and the differences between them generally involved the emphasis on client resocialization and treatment structure. Type DF-A emphasized individual client needs and a supportive approach to therapy. Type DF-CO, on the other hand, tended to stress resocialization of the client and

implemented these goals through use of highly structured treatment, high demand characteristics, and a high level of treatment intervention. For analysis of the DF subsample, the treatment type variable was coded dichotomously (0 = DF-CO, and 1 = DF-A).

Detoxification. Treatments designed for the detoxification of clients were short-term programs (1 to 26 weeks) that focused on withdrawal from illicit drugs and provided minimum subsequent therapeutic services. Two primary subtypes of detoxification programs were identified, Inpatient (DT-IP) and Outpatient (DT-OP). Type DT-IP tended to involve a highly restrictive and rigid structure, while Type DT-OP was more permissive and lower in demand characteristics. In the DARP followup research, only the DT-OP group was represented in sufficient size to be included.

Intake only. A group of DARP admissions which could not be classified or included in the DARP during-treatment studies consisted of persons who completed admission and intake procedures at DARP treatment programs but never returned for actual treatment. In the DARP followup studies, this group has been included as an important comparison sample for contrast with the DARP treatment groups in terms of Post DARP criterion measures and return to other drug treatments. This group, designated as Intake Only (IO) cannot be regarded as a "control group," however, since treatment assignment was not made according to random procedures. Failure to return to DARP treatment similarly cannot be considered to have been randomly determined. (The majority of this group also subsequently entered other drug treatment programs during the 3 years or more after DARP, as recorded in the followup interview.)

Definition of Background, Pre DARP Baseline, and During DARP Performance Predictor Variables

For efficient organization of the regression analysis it was decided to compose derived variables to represent the background, baseline, and during-treatment data available in the DARP records. Many of these were intercorrelated and has similar correlations with the criteria and the construction of derived composites provided an opportunity to avoid redundancy among measures, increase reliability of measures included, and simplify the interpretation of results. This was accomplished by the construction of composite scores to represent the predictor variables within each of these three data sets. It was recognized that the reduced sets of composite measures would have the advantage over the larger numbers of specific variables of being less likely to reflect unique variance which would not be generalizable or applicable across samples. Principal components analysis followed by varimax rotation (referred to subsequently as components analysis) was selected to accomplish this reduction by defining factor scores based on the original predictor variables. This procedure was applied to the background, Pre DARP baseline, and During DARP performance variable sets as described below.

Before examining the components analyses, however, it is important to understand the original measures to which the analyses were applied. Thus, the full set of variables representing background information, Pre DARP baseline data, and During DARP performance indicators is described first for each set, and this is followed by a summary of the corresponding components analysis.

Background Information

Seven measures were utilized to summarize diverse information obtained in the Admission Record regarding client developmental background. These reflect criminal involvement, family contacts, education, and economic factors and are described separately below.

Arrest rate. The total number of arrests involving charges was converted to an arrest rate per year, based on elapsed years between age 12 and the age at admission (exclusive of time incarcerated). To control for extreme values, this measure was then coded by a 6-point scale representing the average number of arrests per year: (1) 0, (2) 0.1-0.2, (3) 0.3-0.4, (4) 0.5-0.8, (5) 0.9-1.5, and (6) over 1.5.

The remaining client background measures are composite indices developed by Joe (1974) and based on a total of 33 items contained in the Admission Record. The indices were scored using 3- to 8-point scales described by Joe and Simpson (1976), in which a score of 1 is uniformly interpreted as reflecting the socially favorable client status with regard to the index and higher scores represent increasingly unfavorable statuses. The background indices are summarized as follows.

Involvement in the drug culture: Age at involvement. Scored on an 8-point scale, this index indicates the period in a client's life when he became involved in the drug culture. It is a composite of age-related variables, including age at first illegal drug use, age at first opiate use, age at first daily opiate use, age at first arrest, and in addition, an item concerning whether the client had ever been declared a juvenile delinquent. The higher the score, the younger the client was at the time of his initial involvement with the drug culture.

Criminal history. This index, measured by a 4-point scale, reflects the extent of the client's previous involvement in criminality, based on the number of arrests and convictions, and total time spent in jail. A score of 1 indicates few such incidents, while a score of 4 indicates many such incidents.

Family responsibility. Also scored on a 4-point scale, this index indicates the amount of responsibility a client had assumed in relation to establishing a family and household at the time of admission to treatment. The index is based on marital status, number of dependents, and living arrangements at the time of admission. A score of 1 indicates that a client was responsible for several dependents, while a score of 4 indicates no responsibility for other persons.

Employment record. This index uses a 5-point scale to measure employment history; it is based on the frequency of employment during the year prior to treatment and also during the 2 months immediately preceding admission. In addition, the client's sources of financial support and type of work performed during the 2 months prior to admission are included in calculation of the index score. A score of 1 indicates continuous full-time employment in a skilled position, while a score of 5 reflects very infrequent or no employment.

Socioeconomic status of parents. Using a 5-point scale, this index reflects the cultural milieu in which the client was raised. It was constructed from information regarding the ethnicity and educational level of each parent, the language spoken in the home and in the neighborhood, and the occupation of the father. The higher the score, the lower the socioeconomic status of the client's parents.

Educational level. This index, based on a 3-point scale, measures the educational achievement of the client as indicated by the highest grade completed and whether or not a high school diploma was received. A score of 1 reflects completion of at least 12 years of education, while a score of 3 indicates that fewer than 9 grades were completed.

Pre DARP Baseline Measures

Baseline data representing criterion levels during the 2 months immediately preceding admission to DARP treatment were defined using the Admission Record. The measures represent illicit drug use, alcohol consumption, illegal activities, and employment.

Illicit drug use. Frequency of drug use during the 2 months prior to admission to treatment was recorded on a 4-point ordinal scale (1 = no use, 2 = less-than-weekly, 3 = weekly, and 4 = daily) for each of nine illicit drug classes: heroin; illegal methadone; other opioid drugs; barbiturates, sedatives and tranquilizers; cocaine; amphetamines and similar agents; hallucinogens and psychedelics; marihuana; and other drugs (including glue and other inhalants). The scores for these different classes of drugs were combined into major categories, of Opioid Use, Nonopioid Use (not including marihuana), and Marihuana Use. Each categorical measure reflects the highest frequency of use reported within that particular class of drugs; Opioid Use was based on heroin, illegal methadone, and other opioids, and Nonopioid Use was based on barbiturates, cocaine, amphetamines, hallucinogens, and other nonopioids (other than marihuana). These major categories of drug use were coded using the same scores as described above (ranging from 1 to 4).

Alcohol use. Pretreatment alcohol use was defined as a composite variable on the basis of the average daily consumption of beer, wine, and hard liquor reported in the Admission Record for the 2 months before admission to DARP. Computation of the measure involved a transformation of consumption levels for each of the three alcohol beverages to a common unit of measurement, based on 80-proof liquor equivalent. The computational procedures included (1) determining the average daily rate of beer, wine, and liquor used by an individual, (2) multiplying the amount for each beverage by a conversion factor to yield average daily ounces of 80-proof alcohol, and (3) summing the three scores to obtain the composite measure for average daily use. The weights used for converting each beverage to 80-proof alcohol were as follows; each can (or bottle) of beer was converted to 1.80 ounces of 80-proof alcohol, each pint of wine to 6.50 ounces, and each drink (or "shot") of liquor to 1.75 ounces.

Because unusually high amounts of alcohol use were sometimes reported, a 4-point index score of average daily 80-proof alcohol was used, representing (1) 0 ounces, (2) 0.1 to 4.0 ounces, (3) 4.1 to 8.0 ounces, and (4) over 8.0 ounces.

Illegal support. Mention in the Admission Record of illegal activities as a source of financial support in the 2 months before treatment was used as an indicator of criminality for the baseline period. For analysis, this variable was coded dichotomously (0 = no illegal support, and 1 = illegal activities reported as a source of support).

Employment. Days worked part time and full time during the 2 months before DARP treatment were reported in the Admission Record. Days worked either part time or full time were summed and scored using a 4-point scale of (1) over 30 days, (2) 16-30 days, (3) 1-15 days, and (4) 0 days.

During DARP Performance Measures

Performance data during treatment in DARP were taken from the bimonthly Status Evaluation Records completed throughout each client's DARP treatment experience. The criterion measures, defined below with regard to each 2-month period during treatment, were averaged over the entire duration of DARP treatment for the purpose of summarizing each client's performance while in DARP. The measures represent illicit drug use, alcohol use, criminality, and employment.

Illegal drug use. Drug use during treatment was defined on a 4-point scale for Opioid Use, Nonopioid Use, and Marihuana Use. The measure used represented an average of all 2-month periods in treatment and was defined as (1) no use, (2) 1-2 days of use, (3) 3-8 days of use, and (4) over 8 days of use.

Alcohol use. Average daily use of 80-proof liquor equivalent during treatment was defined using the same method as for Pre DARP baseline. The 4-point scale used represented (1) 0 ounces, (2) 0.1 to 4.0 ounces, (3) 4.1 to 8.0 ounces, and (4) over 8.0 ounces.

Criminality. Criminal involvement during treatment was assessed on the basis of three different indicators -- arrests, days in jail, and support by illegal activities. From these three variables, a general measure of criminality was defined using a 4-point index based on the occurrence of each separate indicator. Scoring of the general measure was (1) if none occurred, (2) if any one occurred, (3) if any two occurred, and (4) if all three occurred.

Employment. Days worked part time or full time were recorded in the same manner as for the Pre DARP baseline measure and scored on the 4-point scale of (1) over 30 days, (2) 16-30 days, (3) 1-15 days, and (4) 0 days.

Days in treatment. This measure was calculated by counting the number of days between the date of admission to DARP treatment (as reported in the Admission Record) and the date of action for completion, referral, or termination (as reported in the Status Evaluation Record). Certain adjustments were made to the original data, however, in order to improve the precision of this measure of treatment tenure. One adjustment involved clients who did not enter treatment immediately following admission; in these cases, the adjusted date of admission was based on the first day of the first report period in which treatment began. Date of action for treatment completion, referral, and termination occasionally required similar technical corrections. In particular, if the date of action recorded was during a report period in which the Status Evaluation Record indicated that no treatment was received by the client, the date was adjusted to reflect the last day of the preceding report period in which the client did receive treatment. In effect, these adjustments corrected the computation of time in treatment for time delays associated with making official designations of treatment disposition for clients.

For the purpose of analysis, the number of days in treatment was grouped into seven ordinal categories: (1) 1-15 days, (2) 16-30 days, (3) 31-45 days, (4) 46-90 days, (5) 91-180 days, (6) 181-360 days, and (7) over 360 days.

Favorableness of DARP treatment termination. The Status Evaluation Record was also used to report terminations and provided several categories to describe the reason for a client leaving treatment. These were grouped as follows: (1) quit, (2) expelled by the program, (3) left treatment due to hospitalization, incarceration, or death, (4) referred to another treatment program, and (5) completed treatment. To represent these categories on a favorableness of outcome dimension a 3-point scale was defined in which quit and expelled were scored 1 (most unfavorable) and treatment completion was scored 3 (most favorable). Other causes were given an intermediate score of 2.

Components Analysis of Pre DARP Background and Baseline Measures

Table 9 summarizes the results of the components analyses of the background and baseline measures for the combined followup sample from DARP

Table 9

Summary of Principal Components Analysis of Background and Baseline Data for All Clients in Cohorts 1 and 2 Combined

	Factors			Communalities
	1	2	3	
Background Variables (N=2796)				
High Arrest Rate	.94	.05	.04	.88
Low Age at Involv.	.76	-.03	.24	.63
High Crim. History	.84	.17	-.18	.77
Low Family Resp.	.02	-.37	.70	.63
Low Employment	.05	.27	.72	.59
Low Parents SES	.01	.76	-.22	.63
Low Education	.14	.73	.27	.63
Pre DARP Baseline Measures (N=2796)				
High Opioid Use	-.46	.51	-	.47
High Nonop. Use	.74	.15	-	.57
High Mari. Use	.75	.06	-	.57
High Alcohol Use	.35	-.12	-	.14
Illegal Support	.00	.81	-	.66
Low Employment	.08	.65	-	.43

Note. Missing data reduced the total sample which could be analyzed from 3131 to 2796.

Cohorts 1 and 2. The full followup sample (except for persons with missing date) was used in these analyses. These results represent the final product of an extensive series of analyses by separate subsamples, including separate cohort and treatment modality groups (Savage & Lloyd 1977). The factor structures defined for background and baseline measures were substantially the same across these different subsamples. The final factor solutions for the total followup sample were obtained by using the Scree Test to decide on the appropriate number of components to rotate and interpret.

The rotated factor loadings for the background and Pre DARP baseline variables, shown in table 9, represent the correlations of the original variables with the factors defined by the rotated principal components. These factors were the basis of composite variables used in the regression analyses and were labeled so as to indicate the interpretation of high scores on the respective scales. For example, a high score on Low Age at Involvement signifies young age at first illicit drug use.

Background factors. As shown in the upper portion of table 9, three factors were defined to represent the background variables. The measures loading highly on the first factor included High Arrest Rate, High Criminal History, and Low Age at Involvement in the Drug Culture. Persons with high scores on this factor, in contrast to those with low scores, tended to have been more involved in criminal activity and to have begun using drugs at a younger age. On the basis of these defining variables, this factor was labeled Criminality. The second factor had its highest loadings on Low Parents' Socioeconomic Status and Low Education. Persons with little education and with parents of low socioeconomic status scored highest on this factor, which was therefore labeled Low SES. The third factor was defined primarily by Low Employment and Low Family Responsibility. According to these loadings, unemployed persons with few dependents scored highest on this factor, which was labeled Low Social Responsibility.

Pre DARP baseline factors. Only two factors were defined for the Pre DARP baseline measures, as indicated in the lower portion of table 9. The major loadings on the first factor were for High Nonopioid and High Marihuana Use. High Alcohol Use had a moderate positive loading, while High Opioid Use had a moderate negative loading on this factor. Persons using nonopioids and marihuana frequently (but not using opioids) scored highest on this factor, which was labeled Nonopioid Use. The second baseline factor was more general, with major loadings on Illegal Support (as a source of income), Low Employment, and High Opioid Use. This factor reflects a stereotypic pattern of frequent opioid use, accompanied by criminal behavior and unemployment. It was labeled Street Addiction.

Components Analysis of During DARP Performance Measures

The results of the principal components analysis of the During DARP performance measures are presented in table 10. Because of the highly different treatment structure and orientations in the DARP treatment modalities, separate analyses were performed for each of the treatment samples. These included the methadone maintenance (MM), therapeutic community (TC), and outpatient drug free treatment (DF) samples. The MM and DF samples included outpatients and therefore involved a greater range of deviant behaviors during treatment than were observed in the more restricted and isolated residential environment of the TC programs. The outpatient detoxification sample had short treatment tenure and, as a result, during-treatment performance measures were frequently incomplete and not comparably appropriate for analysis; the Intake Only sample spent no time in DARP treatment and therefore had no during-treatment data.

Table 10

Summary of Principal Components Analysis of During DARP Performance Measures for All Clients in DARP Methadone Maintenance, Therapeutic Communities, and Outpatient Drug Free Treatments in Cohorts 1 and 2 Combined

	Factors 1	Factors 2	Communalities
During DARP, Methadone Maintenance Sample (N=1300)			
High Opioid Use	.72	.18	.55
High Nonop. Use	.73	.08	.54
High Mari. Use	.33	.46	.32
High Alcohol Use	.00	.82	.68
High Criminality	.54	.18	.32
Low Employment	.61	-.38	.51
During DARP, Therapeutic Community Sample (N=631)			
High Opioid Use	.81	.07	.67
High Nonop. Use	.48	.43	.42
High Mari. Use	.26	.71	.58
High Alcohol Use	-.08	.75	.57
High Criminality	.78	.05	.62
During DARP, Drug Free Treatment Sample (N=305)			
High Opioid Use	.10	.77	.61
High Nonop. Use	.76	.09	.58
High Mari. Use	.84	-.05	.71
High Alcohol Use	.61	-.03	.37
High Criminality	.04	.74	.56
Low Employment	-.13	.64	.42

Note. Persons with missing data were excluded.

It should be noted that the during-treatment variables entered in the components analysis did not include Days in Treatment or Type of Termination. There was much interest in examining these variables as individual predictors and they were retained as separate measures for inclusion in the multiple regression analyses. Other during-treatment factors are described below for the DARP MM, TC, and DF groups.

During-treatment factors for the MM group. The first of the two factors defined for the MM sample represented a generally negative during-treatment performance record and was labeled Social Deviance. The defining variables with high loadings on Social Deviance were High Opioid Use, High Nonopioid Use, Low Employment, and High Criminality. The second factor had only two defining variables, High Alcohol and High Marihuana Use, and was therefore descriptively labeled Alcohol-Marihuana Use. Low Employment also had a moderate negative correlation with this second factor.

During-treatment factors for the TC group. Although the TC sample involved a supervised residential setting while in DARP treatment, all the performance measures except employment were sufficiently well represented to be included in the analysis. Table 10 shows that even though employment was not included, the two during-treatment factors defined were in fact much like those reported above in the solution based on the outpatient MM sample. The first factor, labeled Social Deviance, represented High Opioid Use and High Criminality, while the second factor, descriptively labeled Alcohol-Marihuana Use, represented High Alcohol Use and High Marihuana Use. High Nonopioid Use had moderate loadings on both of these factors.

During-treatment factors for the DF group. The two factors defined for the DF sample were in some respects similar to those obtained for the other treatment samples. The first factor primarily included High Marihuana Use, High Nonopioid Use, and High Alcohol Use, and was descriptively labeled Nonopioid-Alcohol Use. The factor loadings indicate that (as expected) use of nonopioid drugs was more highly correlated with marihuana and alcohol use in the DF sample than in the MM and TC samples. The second factor, labeled Social Deviance for consistency with the other samples, was principally defined by High Opioid Use, High Criminality, and Low Employment.

Definitions of Post DARP Outcome Criteria

The first year Post DARP outcome measures selected for the regression analyses consisted of a set of 10 criterion variables which were generally the same as those included previously in the gross results (chapter Three). These criterion variables represented illicit drug use, alcohol use, employment, criminality, Post DARP treatments, and a composite criterion measure for the first year after DARP. The specific variables are defined below.

Illicit drug use. The method of scoring Post DARP drug use was essentially the same as for the baseline measures, described earlier. Frequency of drug use during each month in the first year Post DARP was recorded on a 4-point ordinal scale (1 = no use, 2 = less-than-weekly, 3 = weekly, and 4 = daily) for each of the nine following illicit drug classes: heroin, illegal methadone; other opioid drugs; barbiturates, sedatives, and tranquilizers; cocaine; amphetamines and similar agents; hallucinogens and psychedelics; marihuana; and other drugs (including glue and other inhalants). The scores for these different classes of drugs were combined into the major categories of Opioid Use, Nonopioid Use (not including marihuana), and Marihuana Use. Each categorical measure reflected the highest frequency of use reported within that particular class of drugs; Opioid Use was based on heroin, illegal methadone, and other opioids, and Nonopioid Use was based on barbiturates, cocaine, amphetamines, hallucinogens, and other nonopioids (other than marihuana).

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Scores for each of these three measures were averaged across months "at risk" (i.e., months during which the primary place of residence was not a hospital, therapeutic community, or jail). These scores, representing average level of use while at risk, ranged from 1.00 (no use during any month) to 4.00 (daily use during every month) for Opioid Use, Nonopioid Use, and Marihuana Use.

Alcohol Use. Alcohol use was defined as a composite variable on the basis of the average daily consumption of beer, wine, and hard liquor reported in the first year after DARP (Simpson & Lloyd 1976 described the method used in the followup interview to obtain information on alcohol use). Computation of the measure involved a transformation of consumption levels for each of the three alcohol beverages to a common unit of measurement (80-proof liquor equivalent) using the same procedures as described earlier for the Pre DARP baseline alcohol use.

Average daily 80-proof alcohol use during each month after DARP was scaled to a 4-point index score: (1) 0 ounces, (2) 0.1 to 4.0 ounces, (3) 4.1 to 8.0 ounces, and (4) over 8.0 ounces. To summarize alcohol consumption throughout the year, these index scores were then averaged across months "at risk" for each person and the resulting scores ranged from 1.00 (no use during any month) to 4.00 (average use of over 8 ounces daily during each month).

Employment. The number of months in which an individual worked (part time or full time) on a legitimate job in the first year after DARP was the basis of the employment measure. However, in order to avoid bias in the case of persons who were available for employment less than 12 months during this year, scores were computed to reflect the percentage of months employed while "at risk." That is, the number of months employed part time or full time were divided by the number of months that the person was not residing primarily in a jail, hospital, or therapeutic community. For analysis, this measure was then coded into a 3-point scale: (1) 0 percent, never employed during the year, (2) 1-67 percent, employed up to two-thirds at the time "at risk," and (3) over 67 percent, employed over two-thirds of the time "at risk."

Any jail. Periods of incarceration resulting when a person was booked on charges and held in jail for over 72 hours were recorded during each month of the first year Post DARP. Because of the relatively low frequency of occurrence, these data were scored dichotomously, representing (0) no jail episodes during the year, and (1) one or more jail episodes during the year.

Any treatment. The number of months enrolled in any type of drug treatment in the first year after DARP was recorded for each person and scored dichotomously as follows: (0) no treatment received, and (1) one or more months in treatment.

Months of treatment. In addition to the dichotomous score for treatment described above, the actual number of months in any drug treatment in the first Post DARP year was also tabulated for each person; this ranged from 0 to 12.

Months unsupervised. This measure was developed to represent the total amount of time spent without "supervision" in the first year after DARP. In this instance, supervision was defined as being in a jail or in a drug treatment program. The measure was calculated by subtracting the number of months in which most of the time was spent in a jail, hospital, or drug treatment from the total of 12 for the year, resulting in a score ranging from 0 to 12.

Composite. A general composite score representing the first principal component of a profile of outcome measures included in the DARP followup

data, developed by Demaree, Neman, and Hornick (1977), was included in the present study. The profile included abbreviated measures of Post DARP opioid use, nonopioid use, alcohol use, employment, criminality, and drug treatment. Scores on the composite measure ranged from 0 to 40; low scores were interpreted as generally favorable outcomes and high scores as generally unfavorable outcomes.

CHAPTER FIVE -- MULTIPLE REGRESSION ANALYSES

A set of 10 multiple regression analyses, one for each of the criterion variables described in the preceding chapter, was computed for each treatment group in accordance with the model outlined previously in table 8. In this model the multiple correlation coefficient expresses the maximum possible correlation of a linear combination of independent variables (predictors) with a single dependent variable (the criterion). The fixed order of entry of the independent variables reflects the theoretical conceptualization of the hierarchical positions of the independent variables. However, the identification of relevant factors and assessment of their importance as predictors is facilitated by the r, ΔR^2, and β statistics computed and included in the tables of results presented in this chapter.

The magnitude of the multiple correlation in each case indicates the amount of criterion variance accounted for jointly by the independent variables in the model. Criterion variance denotes differential outcomes among persons in the sample and a significant association of a variable with the criterion implies that outcomes differ among persons who have different values of that variable. The portion of total criterion variance accounted for by using the present analytic model, however, involves some theoretical limitations that are worthy of note. For example, the present analysis is designed to address only linear relationships between the predictor and criterion measures; nonlinear associations are not included. A second consideration is that the present analysis does not include interaction components between the predictor variables. Although the current analytic procedure could be modified to add these terms, previous DARP research based on during-treatment data generally found that such interactions accounted for relatively little of the total predictable variance (Gorsuch, Butler, & Sells 1976). Furthermore, there are methodological questions regarding the appropriateness of including such interaction and nonlinear components in a linear regression model (Sockloff, 1976a,b). A third and possibly the most important consideration is the fact that there may be other variables not available or not included in the present research which would help account for differential Post DARP outcomes. For instance, these might include other client background or motivational measures, DARP treatment factors not captured by present measures (such as rapport with treatment personnel, time spent in counseling, etc.), or a variety of sociological factors which may have influenced the lives of DARP clients.

The regression model, therefore, focuses on the estimation of the amount of criterion variance associated with independent (predictor) factors, based on Pre DARP and during treatment, and on the identification of factors among the independent variables that are associated with differential outcomes.

It does not assess the amount or significance of time-related change nor whether change is attributable to treatment. (In the present study the measurement of change was addressed in chapter Three.) The regression results provide a useful basis for the identification of factors, among those included in the analysis, that are associated with differential Post DARP outcomes. To the extent that differential outcomes exist, the utility of regression analysis tends to be enhanced; however, to the extent that outcomes are uniform among the members of the sample, variance tends to be restricted and correlational indications correspondingly reduced.

Theoretical Implications of the Regression Analyses

Significant associations revealed in regression analysis constitute a step toward causal analysis, but do not trace the causal pathways. In many cases, client characteristics and other factors may interact with treatment variables as significant causal variables. Some hypotheses concerning the independent variables in the present model are set forth tentatively below.

The first nine predictor variables in table 8 represent factors that were postulated to exist independently of or prior to a client's involvement in DARP treatment. Should any of these account for significant differential effects, that would indicate the operation of factors other than treatment per se as significant correlates of treatment outcomes. The regression analysis cannot attribute causal influence, but it can point out factors that need to be studied further for that purpose. For some factors, such as age and ethnic group, the hypothesis advanced at this time is that these variables interact differentially with treatment and that a "best fit" schema, of patient types with treatment types, may provide useful guidelines for management of treatment programs. For other factors, such as background criminality and street addiction, causal influence is an attractive hypothesis in the sense that high scores on these factors appear to identify the individuals who are particularly refractory and resistant to change.

The last five predictors in table 8 reflect treatment type, performance during treatment, time spent in treatment, and favorableness of termination. Low or nonexistent relationships of these variables to Post DARP criteria would indicate that DARP treatment indicators are unrelated to posttreatment outcomes and would appear to have negative causal implications for treatment effectiveness. However, it would be possible to have an overall significant improvement in outcome criteria from Pre DARP to Post DARP levels without detecting factors related to differential outcomes between clients in the treatment subsample. Such a result might imply that other factors, such as motivation for rehabilitation reflected by entry into treatment or by legal pressure (not included in the model), might be involved. Another hypothesis might be that the treatment process is equally effective (or ineffective) for all clients and that variations in outcomes, such as those implied by the model, do not occur. These latter hypotheses were contraindicated by earlier research, but the discussion is relevant to the logic of interpretation of the results.

High, significant association of the during-treatment predictors with the criteria is necessary but not sufficient evidence of causality for these variables. Such results are also consistent with motivational explanations. Although causal analysis is not addressed in the present study, the limitations and implications of the results in this respect should nevertheless be clearly understood. To the extent that the multiple correlations between the independent variables and criteria are low, there are important additional factors to be considered regarding the analytic model itself. As mentioned earlier, there are many aspects of the treatment process, including the expertise and proficiency of individual agency programs and rapport

established between treaters and treated, as well as other measures that are not fully captured by the variables included as predictors in the analyses.

Procedures and Results

The results of the regression analyses are presented in tables 11-15. Each table shows the results of the regression analyses on 10 outcome criteria for a DARP treatment group (MM, TC, DF, DT, or IO). As discussed in chapter Four, three statistics for interpretation of the results are provided for each analysis. These are (1) r, the zero-order correlation, (2) ΔR^2, the increase in the squared multiple correlation related to each successive predictor, and (3) β, the standardized regression coefficient. The statistic ΔR^2 explains sequentially the proportion of additional criterion variance that is accounted for by the individual predictors, in the order that they enter the analysis. The statistic β, computed with all predictors included simultaneously in the analysis, enables evaluation of a variable without reference to the order of entry in the regression equation. The interpretations presented below concerning the predictors are limited to those that had significant values of ΔR^2 since only those variables were significantly related to the outcome criteria in the model employed. The values of r and β were used to determine the direction of the significant relationships.

The regression analyses focus on the relationships between predictor and criterion variables and were therefore limited to individuals who had complete and appropriate data on both sets of measures. Since some persons had missing (or not applicable) data for one or more of the measures involved, they had to be excluded from the analyses. For instance, some persons were confined to a jail, hospital, or therapeutic community during the 2 months before DARP admission and did not have appropriate data for computation of pretreatment baseline measures, such as drug use and employment. Similar confinements were possible during all or most of the first year after DARP and this also affected the availability of some outcome criteria. In conformance with the procedures followed in chapter Three on gross results, Post DARP measures for drug (and alcohol) use and employment were computed only for persons who were "at risk" (i.e., free of confinements) at least 3 months in the first year after DARP. However, exclusions based on time at risk after DARP did not apply to outcome criteria involving jail, drug treatment, and months unsupervised. The total number of exclusions required in the regression analyses was relatively high in some instances, particularly in TC and DF where up to 36 percent of the original sample was excluded in some cases. Nevertheless, special analyses to assess the implications and possible bias of these exclusions indicated that the generalizability of the findings in this chapter was not affected (see appendix A for a complete discussion of sample exclusions). The final number of persons included in the analyses is presented on each table.

The first section of this chapter presents the regression analyses for the 10 criteria for the DARP Methadone Maintenance sample. In the later sections, similar analyses are reported for the Therapeutic Community, Drug Free, Detoxification, and Intake Only DARP treatment groups. Intercorrelations among the predictor measures and among the criterion measures within each of the five treatment groups are included in appendix B. (Regression analyses were performed for Cohort 1 and for Cohort 2 separately, but because of small sample sizes in other modalities only those for the DARP MM and TC samples were retained. The results of these separate cohort analyses of the MM and TC samples were similar to those for the combined cohorts, and are shown in appendix D.)

Methadone Maintenance

The multiple regression results for the DARP MM sample are presented in table 11. Of the 821 black and white males in the combined MM sample for both cohorts, there were 653 clients with complete and appropriate data for the six analyses involving drug use and employment, and 682 for the four analyses involving jail and return to drug treatment.

The multiple correlations for the 10 criteria varied between .30 for Nonopioid Use and .43 for the Composite score. As shown by the percentages of variance (R^2) at the bottom of the table, these correlations reflect the fact that the regression model accounted for between 9.3 percent and 18.7 percent of the variance in the criteria and that over 80 percent of the criterion variance was unaccounted for by the variables included in the model. The association of specific predictors and criteria are discussed below. At this point, however, it is important to note several important aspects of these results. First, none of the predictors was significantly associated with more than five of the 10 criteria; indeed, only one (Background Criminality) had five significant associations and three (Age, During DARP Social Deviance, and Days in DARP Treatment) had four. All of the remaining predictors except Pre DARP Nonchemical treatment had at least one significant association. Second, only two of the criteria, Opioid Use and the Composite, had five significant predictors and three, Marihuana Use, Any Jail, and Months Unsupervised, had four; Alcohol Use had three and the remainder had two each. These results illustrate the complexity of the phenomena involved in treatment outcome analysis.

The fact that less than 20 percent of the variance in any of the criteria was accounted for by the model is of much interest. Indeed, over all criteria the percentage of variance accounted for in the MM analysis was lower than that of the other four groups. This is consistent with the results of the during-treatment studies (e.g., Gorsuch, Butler, & Sells 1976). It may reflect the fact that the MM sample spent more time in treatment during the first year Post DARP and had comparatively less time unsupervised (see figure 3), or it may be related to other factors, including differences in sample sizes (MM was the largest sample analyzed and should be less affected by chance variations than in the other smaller samples) and differences in the number and type of predictor variables used (MM, TC, and DF included 14 predictors, while DT had 11 and IO included only nine; IO included none and DT had only two of the five variables for During DARP performance and treatment type).

The salient results shown in table 11 are summarized for the specific criteria as follows.

Opioid use. Higher levels of opioid use during the first year Post DARP were related to:

- Younger age at DARP admission
- Higher background criminality
- Higher baseline street addiction
- Higher during-treatment social deviance
- Shorter time spent in DARP treatment (under 6 months).

Nonopioid use. Higher levels of Post DARP nonopioid use were related to:

- Higher background criminality
- Higher during-treatment social deviance.

Table 11

Summary of Multiple Regression Analyses on DARP Methadone Maintenance Clients

Predictor Variables	Opioid Use r	Opioid Use ΔR^2	Opioid Use β	Nonopioid Use r	Nonopioid Use ΔR^2	Nonopioid Use β	Marihuana Use r	Marihuana Use ΔR^2	Marihuana Use β	Alcohol Use r	Alcohol Use ΔR^2	Alcohol Use β	Employment r	Employment ΔR^2	Employment β
Demographic:															
Black	.05	.00	.06	-.03	.00	-.03	-.04	.00	-.04	.05	.00	.02	-.06	.00	-.03
Age	-.11	.01*	-.08	-.09	.01	-.08	-.26	.07*	-.30*	.02	.00	-.06	.01	.00	-.06
Background:															
Criminality	.13	.02*	.14*	.12	.02*	.10*	-.04	.00	-.02	.04	.00	.06	-.06	.00	-.04
Low SES	-.01	.00	-.05	.02	.00	.04	-.11	.00	-.03	.06	.00	.09	-.10	.01	-.05
Low Soc. Resp.	.14	.01	.01	.10	.00	-.04	.04	.01	-.15*	-.06	.01	-.04	-.21	.04*	-.12
Previous Trt.:															
Chemical	.01	.00	.04	.02	.00	.03	-.07	.00	-.05	-.03	.00	-.02	.00	.00	-.00
Non-Chemical	-.03	.00	-.03	.02	.00	.02	.01	.00	.02	.03	.00	.02	.05	.00	.02
Pre DARP Baseline:															
Nonop. Use	-.03	.00	-.09	.07	.00	.02	.17	.02*	.13*	.07	.01	.08	-.06	.00	-.01
Street Addict.	.15	.01*	.09	.14	.01	.07	.09	.02*	.14*	-.01	.00	-.02	-.17	.00	-.01
DARP Trt. Type:															
MM-A	.08	.00	.05	.07	.00	.06	.04	.00	-.01	-.08	.01*	-.10	-.03	.00	-.04
During DARP Performance:															
Social Deviance	.21	.03*	.12*	.24	.04*	.20*	.07	.00	.03	-.02	.00	-.08	-.29	.05*	-.23*
Alc-Mari. Use	-.05	.00	-.00	-.00	.00	.02	.14	.02*	.14*	.24	.05*	.25*	.11	.01	.08
Days in Trt.	-.24	.03*	-.18*	-.13	.00	-.07	.00	.00	.01	-.06	.02*	-.13*	.11	.00	-.00
Favorable Term.	-.12	.00	-.05	-.07	.00	-.01	.03	.00	.01	-.03	.00	-.02	.15	.01	.08
Multiple R		.36*			.30*			.37*			.31*			.36*	
% of Variance (R^2)		12.7%			9.3%			13.8%			9.8%			12.6%	
No. of Persons		653			653			653			653			653	

*p<.01

Table 11 (Cont.)

Predictor Variables	Any Jail			Any Treatment			Months of Treatment			Months Unsupervised			Composite Score		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.03	.00	.04	-.26	.07*	-.24*	-.29	.08*	-.27*	.26	.07*	.24*	-.04	.00	-.04
Age	-.16	.03*	-.19*	-.03	.00	-.01	.03	.00	.03	.03	.00	.03	-.14	.02*	-.10
Background:															
Criminality	.20	.05*	.22*	.05	.00	.05	.04	.00	.02	-.13	.01*	-.12*	.20	.05*	.20*
Low SES	.07	.01*	.08	-.01	.00	.06	.00	.00	.08	-.03	.01*	-.09	.03	.01	.03
Low Soc. Resp.	.18	.01	.06	.05	.00	.08	.01	.00	.06	-.09	.01	-.11	.22	.03*	.08
Previous Trt.:															
Chemical	.03	.00	.05	.16	.01*	.11*	.15	.01	.09	-.17	.01*	-.11*	.06	.00	.07
Non-Chemical	-.01	.00	-.02	.03	.00	-.01	.03	.00	-.01	-.03	.00	.01	-.02	.00	-.04
Pre DARP Baseline:															
Nonop. Use	.01	.00	-.03	-.03	.00	-.01	-.04	.00	-.00	.06	.00	.05	.04	.00	-.02
Street Addict.	.14	.00	.04	-.05	.00	-.09	-.08	.01	-.10	.02	.00	.08	.19	.01	.06
DARP Trt. Type:															
MM-A	.04	.00	.01	-.05	.00	-.03	-.05	.00	-.02	.04	.00	.02	.07	.00	.05
During DARP Performance:															
Social Deviance	.15	.01	.05	.03	.00	.05	-.02	.00	.02	-.05	.00	-.05	.30	.05*	.19*
Alc-Mari. Use	-.01	.00	.04	-.04	.00	-.03	-.07	.00	-.07	.07	.00	.04	-.05	.00	.02
Days in Trt.	-.09	.00	-.03	.08	.01	.08	.13	.01*	.13*	-.08	.01	-.11	-.21	.02*	-.11*
Favorable Term.	-.14	.01*	-.12*	.02	.00	.00	.03	.00	-.00	.02	.00	.04	-.16	.01	-.09
Multiple R		.36*			.32*			.35*			.36*			.43*	
% of Variance (R^2)		12.7%			10.4%			12.2%			13.0%			18.7%	
No. of Persons		682			682			682			682			653	

*$p<.01$

Marihuana use. Higher levels of Post DARP marihuana use were related to:

- Younger age at DARP admission
- Higher baseline nonopioid drug use
- Higher baseline street addiction
- Higher during-treatment alcohol and marihuana use.

Alcohol use. Higher average daily consumption of 80-proof alcohol Post DARP was related to:

- DARP treatment in MM-CO
- Higher during-treatment alcohol and marihuana use
- Shorter time spent in DARP treatment (under 6 months).

Employment. Higher levels of Post DARP employment (scaled values for percentage of months employed) were related to:

- Higher background social responsibility
- Lower during-treatment social deviance.

Any jail. Post DARP incarceration in jail (one or more times) was related to:

- Younger age at DARP admission
- Higher background criminality
- Lower background socioeconomic status
- Unfavorable termination from DARP treatment.

Any treatment. Post DARP drug treatment (one month or more in any type of drug treatment) was related to:

- Ethnicity (whites were more likely to reenter treatment)
- Pre DARP experience in chemical treatments (i.e., MM or DT).

Months in treatment. Longer time spent in treatment during the first year Post DARP was related to:

- Ethnicity (whites had more months in treatment)
- Longer time spent in DARP treatment (over 6 months).

Months unsupervised. Longer time spent unsupervised (based on months not in jail or drug treatment) during the first year Post DARP was related to:

- Ethnicity (blacks had more time unsupervised)
- Lower background criminality
- Higher background SES
- No Pre DARP experience in chemical treatments (i.e., MM or DT).

Composite score. Higher scores on the Post DARP composite index (indicating more unfavorable outcomes) were related to:

- Younger age at DARP admission
- Higher background criminality
- Lower background social responsibility
- Higher during-treatment social deviance
- Shorter time spent in DARP treatment (under 6 months).

Therapeutic Community

The results of the multiple regression analyses for the sample of former DARP TC clients are summarized in table 12. Of the 735 black and white males

Table 12

Summary of Multiple Regression Analyses on
DARP Therapeutic Community Clients

Predictor Variables	Opioid Use			Nonopioid Use			Marihuana Use			Alcohol Use			Employment		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.09	.01	.09	-.05	.00	-.03	-.01	.00	.06	.00	.00	.01	-.11	.01	-.07
Age	.03	.00	-.03	.01	.00	.04	-.16	.03*	-.04	.09	.01	.10	.04	.00	-.03
Background:															
Criminality	.03	.00	.01	.01	.00	.03	-.06	.00	-.03	.02	.00	.04	-.05	.00	-.04
Low SES	.04	.00	-.03	.05	.00	.04	-.10	.01	-.11	-.05	.01	-.06	-.10	.01	-.05
Low Soc. Resp.	.05	.00	.02	.05	.00	.07	.19	.02*	.18*	-.13	.01	-.05	-.22	.04*	-.19*
Previous Trt.:															
Chemical	.08	.01	.08	.06	.00	.05	-.01	.00	.02	-.03	.00	-.03	.09	.01	.10
Non-Chemical	-.01	.00	.04	-.04	.00	-.02	-.12	.01	-.10	.06	.00	.06	.09	.01	.05
Pre DARP Baseline:															
Nonop. Use	-.07	.00	-.06	.24	.06*	.23*	.15	.02*	.10	.07	.01	.08	-.06	.01	-.08
Street Addict.	.14	.01	.13	.00	.00	-.01	.02	.00	.00	-.13	.01	-.11	-.17	.01	-.12
DARP Trt. Type:															
TC-T	-.09	.01	-.06	-.13	.01	-.06	-.09	.01	-.06	.03	.00	.05	.06	.00	.03
During DARP Performance:															
Social Deviance	.15	.02*	.08	.03	.00	-.02	-.02	.00	-.02	-.07	.00	-.06	-.08	.01	-.03
Alc-Mari. Use	-.00	.00	.04	.04	.00	.01	.10	.00	.08	.06	.00	.05	.03	.00	-.00
Days in Trt.	-.37	.13*	-.32*	-.28	.07*	-.25*	-.10	.01	-.11	-.01	.00	-.05	.34	.11*	.28*
Favorable Term.	-.26	.01	-.10	-.19	.00	-.07	-.05	.00	.00	.02	.00	.03	.26	.01	.11
Multiple R		.45*			.40*			.32*			.23			.47*	
% of Variance (R^2)		20.1%			15.8%			10.2%			5.2%			22.3%	
No. of Persons		474			474			474			474			474	

*p<.01

Table 12 (Cont.)

Predictor Variables	Any Jail			Any Treatment			Months of Treatment			Months Unsupervised			Composite Score		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.06	.00	.02	-.05	.00	-.05	-.01	.00	.00	-.04	.00	.00	.05	.00	.04
Age	.01	.00	-.05	.11	.01*	.08	.15	.02*	.11	-.12	.01	-.04	.04	.00	.02
Background:															
Criminality	.16	.02*	.14*	.05	.00	.04	.07	.00	.03	-.21	.04*	-.18*	.07	.00	.06
Low SES	.09	.01	.06	-.07	.01	-.09	-.03	.00	-.07	-.07	.00	-.02	.06	.00	.00
Low Soc. Resp.	.04	.00	-.02	-.07	.00	-.05	-.08	.00	-.04	.04	.00	.05	.08	.01	.06
Previous Trt.:															
Chemical	-.02	.00	-.04	.07	.00	.04	.11	.01	.08	-.07	.00	-.02	.06	.00	.03
Non-Chemical	.05	.00	.07	-.02	.00	-.02	.02	.00	.02	-.04	.00	-.04	-.04	.00	.00
Pre DARP Baseline:															
Nonop. Use	-.05	.00	-.03	.04	.00	.02	.04	.00	.04	.03	.00	.01	.07	.01	.07
Street Addict.	.11	.01	.10	.10	.01	.12	.09	.01	.10	-.13	.01	-.11	.15	.01	.14*
DARP Trt. Type:															
TC-T	.05	.00	.08	-.15	.01*	-.10	-.13	.01	-.09	.05	.00	.02	-.13	.01	-.05
During DARP Performance:															
Social Deviance	.11	.01	.08	.07	.00	.01	.05	.00	.00	-.07	.00	-.01	.15	.01*	.06
Alc-Mari. Use	.05	.01	.10	.09	.00	.08	.06	.00	.06	-.03	.00	-.06	.05	.00	.08
Days in Trt.	-.28	.09*	-.25*	-.15	.02*	-.13*	-.12	.02*	-.12	.29	.09*	.25*	-.48	.22*	-.41*
Favorable Term.	-.23	.01	-.11	-.10	.00	-.06	-.07	.00	-.03	.22	.01	.12	-.34	.07	-.15*
Multiple R		.39*			.30*			.28*			.40*			.55*	
% of Variance (R^2)		15.6%			8.9%			7.6%			16.3%			30.6%	
No. of Persons		510			510			510			510			474	

*p<.01

in the combined TC sample for both cohorts, there were 474 clients with complete data for the six analyses involving drug use and employment, and 510 for the other four analyses involving jail and return to drug treatment.

The variance accounted for by the model was higher in TC than MM on six of the 10 criteria, but the patterns of relationship were quite different. Six of the predictors (Black, Low Background SES, Previous Chemical and Non-Chemical Treatments, Baseline Street Addiction, and During DARP Alcohol-Marihuana Use) were unrelated to any of the criteria, while one (Days in DARP Treatment) was significantly related to eight of the criteria. Of the remainder, two predictors (DARP Treatment Type and Favorableness of Termination) were related to only one criterion, four (Background Criminality, Low Background Social Responsibility, Baseline Nonopioid Use, and During DARP Social Deviance) to two criteria, and one (Age), to three criteria. Similarly, none of the criteria were predicted significantly by more than three independent variables. Three (Marihuana Use, Any Treatment, and the Composite) had three significant predictors; six (Opioid Use, Nonopioid Use, Employment, Any Jail, Months in Treatment, and Months Unsupervised) had two significant predictors; and one (Alcohol Use) had none.

The multiple correlation for Alcohol Use (.23) was not significant at the .01 level and the results of this analysis have been omitted from the summary presented below. All of the remaining nine analyses yielded statistically significant multiple correlations ($p<.01$), ranging from .28 (7.6 percent of the criterion variance) to .55 (30.6 percent). The results of these analyses, indicating the significant predictors and the direction of their relationships with the criterion measure, are summarized below.

Opioid use. Higher levels of opioid use during the first year Post DARP were related to:

- Higher during-treatment social deviance
- Shorter time spent in DARP treatment (less than about 3 months).

Nonopioid use. Higher levels of Post DARP nonopioid use were related to:

- Higher baseline nonopioid use
- Shorter time spent in DARP treatment (less than about 3 months).

Marihuana use. Higher levels of Post DARP marihuana use were related to:

- Younger age at DARP admission
- Lower background social responsibility
- Higher baseline nonopioid use.

Employment. Higher levels of Post DARP employment (scaled values for the percentage of months employed) were related to:

- Higher background social responsibility
- Longer time spent in DARP treatment (over about 3 months).

Any jail. Post DARP incarcerations in jail (one or more times) were related to:

- Higher background criminality
- Shorter time spent in DARP treatment (less than about 3 months).

Any treatment. Post DARP drug treatment (one month or more in any type of drug treatment) was related to:

- Older age at DARP admission
- DARP treatment in TC-ST&M
- Shorter time spent in DARP treatment (less than about 3 months).

Months in treatment. Longer time spent in treatment during the first year Post DARP was related to:

- Older age at DARP admission
- Shorter time spent in DARP treatment (less than about 3 months).

Months unsupervised. Longer time spent unsupervised (based on months not in jail or drug treatment) during the first year Post DARP was related to:

- Lower background criminality
- Longer time spent in DARP treatment (over about 3 months).

Composite score. Higher scores on the Post DARP composite index (indicating more unfavorable outcomes) were related to:

- Higher during-treatment social deviance
- Shorter time spent in DARP treatment (less than about 3 months)
- Unfavorable termination from DARP treatment.

Drug Free Treatment

The multiple regression results for the DARP DF sample are summarized in table 13. Of the 289 black and white males in the combined DF sample for both cohorts, there were 182 clients with complete data for the six analyses involving drug use and employment, and 200 for the four analyses involving jail and return to drug treatment.

The multiple correlations for the DF sample were higher than the corresponding coefficients for eight of the 10 criteria in MM, and nine of the 10 in TC. Only one predictor (Days in Treatment) was significantly related to five criteria and seven were unrelated to any of the criteria. One predictor (Previous Chemical Treatment) was significantly related to four criteria, two (Background Criminality and During DARP Social Deviance) to three criteria, one (Low Background SES) to two criteria, and two (During DARP Non-opioid-Alcohol Use, and Baseline Street Addiction) to one criterion. Opioid use was predicted significantly by four predictors while only one criterion (Marihuana Use) was not predicted significantly at all. Three criteria (Nonopioid Use, Any Jail, and the Composite) had three significant predictors, and four (Alcohol Use, Employment, Any Treatment, and Months in Treatment) had one significant predictor.

Notwithstanding the small sample size, the multiple correlations obtained for six of the outcome criteria were significant ($p<.01$) and ranged between .43 (18.1 percent of the criterion variance) and .58 (33.4 percent); the non-significant multiple correlations were with Marihuana Use, Alcohol Use, Any Treatment, and Months of Treatment. Although the multiple correlation with Alcohol Use was not significant, there was a significant relationship between during treatment Alcohol-Marihuana Use and this Post DARP criterion. Also, Previous Chemical Treatment was significantly related to the Post DARP criteria for Any Treatment and Months of Treatment even though the overall multiple correlations were short of statistical significance.

The specific relationships involving Post DARP criteria with significant multiple correlations are summarized below.

Table 13

Summary of Multiple Regression Analyses on
DARP Outpatient Drug Free Clients

Predictor Variables	Opioid Use			Nonopioid Use			Marihuana Use			Alcohol Use			Employment		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.05	.00	-.03	-.10	.01	-.05	-.05	.00	.01	-.05	.00	-.06	-.08	.01	.01
Age	.01	.00	-.02	-.17	.03	-.17	-.18	.03	-.19	.09	.01	.13	.12	.02	.08
Background:															
Criminality	.22	.05*	.13	.15	.02	.11	.01	.00	.05	.07	.01	.14	-.19	.03	-.13
Low SES	.09	.01	-.02	-.02	.00	-.03	-.03	.00	.05	.10	.01	.12	-.19	.04*	-.15
Low Soc. Resp.	.08	.01	.05	.07	.00	-.03	.03	.01	-.07	.01	.00	.02	-.21	.02	-.10
Previous Trt.:															
Chemical	.25	.05*	.18	.23	.06*	.26*	-.05	.00	.02	-.00	.00	-.03	-.03	.00	.06
Non-Chemical	.10	.00	.04	.15	.01	.06	-.02	.00	-.05	-.05	.00	-.09	.00	.00	.05
Pre DARP Baseline:															
Nonop. Use	-.23	.02	-.08	.15	.02	.22*	.23	.03	.19	.06	.01	.11	.14	.01	.07
Street Addict.	.22	.01	-.06	.08	.00	-.12	-.08	.00	-.05	-.01	.00	-.05	-.24	.01	-.05
DARP Trt. Type:															
DF-A	.10	.01	.10	.11	.01	.12	-.01	.00	.02	-.13	.01	-.10	-.09	.01	-.10
During DARP Performance:															
Nonop-Alc. Use	-.08	.00	-.01	-.02	.00	-.01	.10	.01	.09	.25	.06*	.23*	-.00	.00	-.06
Social Deviance	.40	.08*	.21	.16	.04*	.11	-.12	.00	-.12	.11	.01	.15	-.26	.02	-.09
Days in Trt.	-.42	.07*	-.28*	-.27	.06*	-.27*	-.05	.02	-.16	.01	.00	.05	.23	.02	.15
Favorable Term.	-.23	.00	-.07	-.08	.00	-.02	-.02	.00	-.04	-.07	.00	-.05	.17	.00	-.07
Multiple R		.56*			.50*			.33			.37			.43*	
% of Variance (R^2)		31.1%			24.9%			11.1%			14.0%			18.1%	
No. of Persons		182			182			182			182			182	

*p<.01

Table 13 (Cont.)

Predictor Variables	Any Jail			Any Treatment			Months of Treatment			Months Unsupervised			Composite Score		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.08	.01	-.04	-.07	.01	-.09	-.12	.01	-.15	-.02	.00	.07	-.01	.00	-.08
Age	.07	.00	-.01	.04	.00	-.05	.06	.01	.01	-.17	.03	-.09	-.06	.00	-.12
Background:															
Criminality	.15	.03	.09	.02	.00	-.05	.01	.00	-.05	-.17	.04*	-.10	.21	.04*	.11
Low SES	.24	.05*	.21*	.06	.01	-.01	.03	.00	-.03	-.18	.02	-.09	.15	.02	.08
Low Soc. Resp.	-.03	.00	-.09	.00	.00	-.07	.00	.00	.01	.04	.00	.05	.10	.00	-.02
Previous Trt.:															
Chemical	.00	.00	-.08	.27	.06*	.24*	.23	.04*	.19	-.19	.02	-.10	.22	.03	.13
Non-Chemical	.08	.00	.03	.04	.00	.00	.06	.00	.03	-.10	.00	-.05	.10	.00	.02
Pre DARP Baseline:															
Nonop. Use	.09	.00	.04	-.15	.02	-.11	-.13	.01	-.09	.20	.01	.07	-.18	.02	-.07
Street Addict.	.22	.03*	.13	.12	.01	.03	.07	.00	-.05	-.23	.02	-.09	.27	.03	.04
DARP Trt. Type:															
DF-A	-.05	.00	-.06	.01	.00	.02	.00	.00	.02	.01	.00	.01	.07	.00	.07
During DARP Performance:															
Nonop-Alc. Use	-.05	.00	.03	-.01	.00	.02	-.05	.00	-.04	.05	.00	-.03	-.02	.00	.06
Social Deviance	.23	.01	-.01	.17	.01	.13	.15	.02	.12	-.26	.01	-.04	.37	.06*	.12
Days in Trt.	-.41	.10*	-.35*	-.11	.00	-.06	-.16	.01	-.14	.37	.06*	.28*	-.47	.12*	-.38*
Favorable Term.	-.17	.00	-.04	-.00	.00	.07	-.02	.00	.05	.15	.00	.01	-.22	.00	-.04
Multiple R		.49*			.34			.34			.47*			.58*	
% of Variance (R^2)		24.4%			11.6%			11.3%			22.0%			33.4%	
No. of Persons		200			200			200			200			182	

*p<.01

Opioid use. Higher levels of opioid use during the first year Post DARP were related to:

- Higher background criminal history
- Pre DARP experience in chemical treatments (i.e., MM or DT)
- Higher during-treatment social deviance
- Shorter time spent in DARP treatment (less than about 2 months).

Nonopioid use. Higher levels of Post DARP nonopioid use were related to:

- Pre DARP experience in chemical treatments (i.e., MM or DT)
- Higher during-treatment social deviance
- Shorter time spent in DARP treatment (less than about 2 months).

Employment. Higher levels of Post DARP employment (scaled values for percentage of months employed) were related to:

- Higher background socioeconomic status.

Any jail. Post DARP incarcerations in jail (one or more times) were related to:

- Lower background socioeconomic status
- Higher baseline street addiction
- Shorter time spent in DARP treatment (less than about 2 months).

Months unsupervised. Longer time spent unsupervised (based on months not in jail or drug treatment) during the first year Post DARP was related to:

- Lower background criminal history
- Longer time spent in DARP treatment (more than about 2 months).

Composite score. Higher scores on the Post DARP composite index (indicating more unfavorable outcomes) were related to:

- Higher background criminal history
- Higher during-treatment social deviance
- Shorter time spent in DARP treatment (less than about 2 months).

Detoxification

The results of the multiple regression analyses for the DARP DT sample are summarized in table 14. Of the 174 black and white males in the combined DT sample for both cohorts, there were 148 clients with complete data for the six analyses involving drug use and employment, and 153 for the four analyses involving jail and return to drug treatment. Despite the small sample sizes the multiple correlations obtained were significant ($p<.01$) in seven of the analyses, and ranged from .41 (17.1 percent of the criterion variance) to .49 (24.1 percent). Nonsignificant results were obtained for three criteria (Nonopioid Use, Any Jail, and Months Unsupervised) but the latter two measures each had one significant predictor. Although the overall multiple correlation for Employment was significant, none of the specific predictors was. The DT multiple correlations were greater than those for MM on nine of the 10 criteria; they exceeded those for TC on five and those for DF on only four. In general the numbers of significant relations with predictors and numbers of significant predictors of the 10 criteria were lower in DT than in the MM, TC, and DF samples.

A brief description of the results for each criterion variable with a significant multiple correlation, including the significant specific predictors identified, is presented below.

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Table 14

Summary of Multiple Regression Analyses on DARP Outpatient Detoxification Clients

Predictor Variables	Opioid Use			Nonopioid Use			Marihuana Use			Alcohol Use			Employment		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.06	.00	.16	-.21	.04	-.16	-.06	.00	.01	-.18	.03	-.16	.18	.03	.13
Age	.03	.00	-.14	-.04	.00	-.14	-.23	.05*	-.25*	.13	.03	.15	-.12	.02	-.13
Background:															
Criminality	.30	.10*	.28*	.09	.00	.03	.06	.01	.08	-.01	.00	-.12	-.23	.03	-.16
Low SES	.17	.02	.13	.08	.01	.14	-.25	.04*	-.21	.15	.01	.12	-.16	.02	-.10
Low Soc. Resp.	-.03	.00	-.17	-.07	.03	-.23	-.00	.01	-.18	.05	.00	-.01	-.11	.01	-.07
Previous Trt.:															
Chemical	.15	.02	.12	.13	.01	.07	.02	.00	.04	.02	.00	-.04	-.20	.01	-.10
Non-Chemical	.16	.02	.17	.17	.02	.18	.04	.00	.06	.21	.03	.21	-.06	.00	.01
Pre DARP Baseline:															
Nonop. Use	-.05	.00	-.05	.16	.03	.14	.22	.04	.16	.19	.04*	.20	.03	.00	.06
Street Addict.	.20	.03	.19	.05	.00	.06	.10	.03	.19	.16	.01	.12	-.20	.01	-.11
During DARP Performance:															
Days in Trt.	-.03	.00	-.06	.02	.00	-.05	.05	.00	.01	-.00	.00	-.04	.06	.00	.08
Favorable Term.	.04	.00	.07	.16	.02	.15	.23	.02	.15	-.01	.00	-.00	-.11	.02	-.15
Multiple R		.46*			.40			.46*			.41*			.41*	
% of Variance (R^2)		20.8%			15.7%			20.8%			16.7%			16.5%	
No. of Persons		148			148			148			148			148	

*p<.01

Table 14 (Cont.)

Predictor Variables	Any Jail			Any Treatment			Months of Treatment			Months Unsupervised			Composite Score		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.03	.00	.07	-.36	.13*	-.32*	-.30	.09*	-.30*	.18	.03	.15	-.16	.03	-.06
Age	.04	.00	-.08	.08	.02	.16	.09	.02	.12	-.15	.03	-.11	.04	.01	-.08
Background:															
Criminality	.21	.05*	.20	.04	.00	-.05	.06	.00	-.01	-.19	.02	-.14	.31	.07*	.24*
Low SES	.08	.00	.04	.07	.00	.09	.03	.00	.05	-.09	.00	-.10	.18	.02	.17
Low Soc. Resp.	-.06	.00	-.13	.12	.01	.15	-.00	.00	.01	.06	.00	.03	.00	.00	-.13
Previous Trt.:															
Chemical	.09	.01	.08	.25	.03	.14	.13	.00	.04	-.15	.01	-.06	.24	.03	.15
Non-Chemical	.09	.01	.08	.15	.00	.07	.10	.00	.03	-.13	.00	-.06	.20	.02	.16
Pre DARP Baseline:															
Nonop. Use	-.14	.02	-.14	-.06	.01	-.09	.03	.00	-.01	.02	.00	.04	-.01	.00	-.03
Street Addict.	.08	.01	.11	.02	.00	-.07	-.00	.00	-.03	-.03	.00	.00	.18	.02	.13
During DARP Performance:															
Days in Trt.	-.06	.00	-.07	.06	.00	.02	.19	.03	.15	-.14	.01	-.09	-.00	.00	-.05
Favorable Term.	.01	.00	.04	.19	.04*	.22*	.18	.02	.17	-.21	.04*	-.21*	.15	.03	.18
Multiple R		.31			.49*			.41*			.39			.48*	
% of Variance (R^2)		9.8%			24.1%			17.1%			15.6%			22.6%	
No. of Persons		153			153			153			153			148	

*p<.01

Opioid use. Higher levels of opioid use during the first year Post DARP were related to:

. Higher background criminality.

Marihuana use. Higher levels of Post DARP marihuana use were related to:

. Younger age at DARP admission
. Higher background socioeconomic status.

Alcohol use. Higher average daily consumption of 80-proof alcohol Post DARP was related to:

. Higher baseline nonopioid drug use.

Any treatment. Post DARP drug treatment (one month or more in any type of drug treatment) was related to:

. Ethnicity (whites were more likely to reenter treatment)
. Favorable termination from DARP treatment.

Months in treatment. Longer time spent in treatment during the first year Post DARP was related to:

. Ethnicity (whites had more months in treatment Post DARP).

Composite score. Higher scores on the Post DARP composite index (indicating more unfavorable outcomes) were related to:

. Higher background criminality.

Intake Only

The multiple regression results for the Intake Only sample, consisting of former DARP clients who were admitted but did not receive any DARP treatment, are presented in table 15. Of the 159 black and white males in the combined IO sample for both cohorts, there were 126 with complete data for the six analyses involving drug use and employment, and 143 for the four analyses involving jail and return to drug treatment. The multiple correlations were in several cases comparable in magnitude with those for other treatments but as a result of the small sample size they were statistically significant ($p<.01$) for only half of the 10 criteria; these included Marihuana Use, Any Treatment, Months in Treatment, Months Unsupervised, and the Composite score. Of those with nonsignificant multiple correlations, however, the criteria for Alcohol Use and Any Jail had significant specific predictors associated with them. A description of the results associated with significant multiple correlations is summarized below.

Marihuana use. Higher levels of Post DARP marihuana use were related to:

. Younger age at DARP admission.

Any jail. Post DARP incarcerations in jail (one or more times) were related to:

. Higher background criminality.

Any treatment. Post DARP drug treatment (one month or more in any type drug treatment) was related to:

. Ethnicity (whites were more likely to reenter treatment).

Table 15

Summary of Multiple Regression Analyses on
DARP Intake Only Clients

Predictor Variables	Opioid Use			Nonopioid Use			Marihuana Use			Alcohol Use			Employment		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.16	.03	.08	-.14	.02	-.13	-.14	.02	.01	-.08	.01	.03	-.08	.01	-.05
Age	-.00	.00	-.13	-.15	.02	-.12	-.37	.13*	-.31*	.02	.00	.13	.00	.00	.03
Background:															
Criminality	.16	.03	.11	.05	.01	.06	-.15	.01	-.09	-.05	.00	-.04	-.21	.04	-.19
Low SES	.19	.03	.14	-.03	.00	-.00	-.19	.01	-.07	-.09	.01	-.09	-.10	.01	-.05
Low Soc. Resp.	.08	.00	-.07	.10	.00	-.01	.14	.00	-.02	.06	.01	.03	-.10	.01	-.00
Previous Trt.:															
Chemical	.07	.01	.07	-.07	.01	-.09	-.02	.00	.04	-.03	.00	-.02	.01	.00	.02
Non-Chemical	-.13	.01	-.09	-.01	.00	-.03	.01	.00	.02	-.03	.00	-.03	.10	.01	.10
Pre DARP Baseline:															
Nonop. Use	-.19	.02	-.11	.16	.01	.11	.29	.03	.21	.32	.09*	.35*	-.01	.00	-.07
Street Addict.	.27	.03	.22	.10	.01	.13	-.09	.00	.00	.03	.00	.08	-.21	.02	-.16
Multiple R		.38			.27			.45*			.36			.31	
% of Variance (R^2)		14.8%			7.4%			20.0%			12.8%			9.4%	
No. of Persons		126			126			126			126			126	

*p<.01

Table 15 (Cont.)

Predictor Variables	Any Jail			Any Treatment			Months of Treatment			Months Unsupervised			Composite Score		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.12	.01	.12	-.35	.12*	-.36*	-.33	.11*	-.35*	.13	.02	.14	-.00	.00	-.04
Age	-.01	.00	-.20	-.04	.00	-.06	-.06	.00	-.03	-.02	.00	.09	-.10	.01	-.24
Background:															
Criminality	.25	.06*	.23*	.04	.00	.01	.09	.01	.07	-.30	.09*	-.26*	.22	.06*	.18
Low SES	.18	.03	.21	-.15	.01	-.08	-.21	.02	-.17	.06	.00	.02	.15	.03	.16
Low Soc. Resp.	-.08	.02	-.19	-.07	.00	-.13	.01	.00	-.03	.12	.01	.16	.04	.00	-.18
Previous Trt.:															
Chemical	.08	.01	.12	.12	.00	.05	.08	.00	-.00	-.17	.01	-.12	.03	.00	.02
Non-Chemical	.03	.00	.05	.09	.00	.04	.12	.00	.08	-.10	.01	-.08	-.09	.01	-.07
Pre DARP Baseline:															
Nonop. Use	-.11	.00	-.00	.05	.01	-.05	.04	.01	-.09	.08	.01	.07	-.05	.00	-.00
Street Addict.	.05	.00	.04	.12	.04	.24	.17	.04*	.24*	-.10	.01	-.13	.25	.05*	.27*
Multiple R		.37			.43*			.46*			.40*			.39*	
% of Variance (R^2)		14.1%			18.7%			20.8%			16.1%			15.5%	
No. of Persons		143			143			143			143			126	

*p<.01

Months in treatment. Longer time spent in treatment during the first year Post DARP was related to:

. Ethnicity (whites had more months in treatment)
. Higher baseline street addiction.

Months unsupervised. Longer time spent unsupervised (based on months not in jail or drug treatment) during the first year Post DARP was related to:

. Lower background criminality.

Composite score. Higher scores on the Post DARP composite index (indicating more unfavorable outcomes) were related to:

. Higher background criminal history
. Higher baseline street addiction.

CHAPTER SIX -- SUMMARY AND INTEGRATION OF RESULTS

The study reported here should be regarded as representing a major investigation in the DARP research program on evaluation of drug abuse treatment. Specifically, it is one of a series of related investigations that together will provide the basis for an overall report on the posttreatment evaluation of DARP Cohorts 1 and 2. The issues addressed in the present study involve changes from Pre DARP to the first full year Post DARP in samples of DARP MM, TC, DF, and DT clients and a comparison sample that was formally admitted, but did not participate in DARP treatment (IO, Intake Only). The amount of change on selected criteria was measured and evaluated statistically in each treatment sample, and Post DARP outcomes of the five samples were compared after taking into account population differences, treatment histories, and status at admission to DARP treatment. In addition, factors associated with variations in Post DARP outcomes on each of 10 criterion measures were identified by means of a step-down, hierarchical multiple regression model applied uniformly to each of the treatment samples separately.

The design and results of these analyses have been reported in detail in chapter Three (Pre DARP to Post DARP changes and group comparisons of adjusted outcome scores) and in chapter Five (regression study). This chapter presents a brief discussion of several important methodological considerations involved in this study and summarizes the results obtained in each of the three major sets of analyses. The following chapter addresses the implications of the results.

Methodological Considerations

As in every field research endeavor, a number of difficult decisions were faced and resolved in the present study. Since these have a bearing on the interpretation of the results, the rationale for the positions taken is explained at the outset of this discussion.

Sample adjustments. Although the numbers of clients in various categories of the Cohort 1 and 2 samples have been described in chapter two, the actual numbers in various groups on which different computations were based were frequently smaller. The logic by which subsamples were selected has been mentioned in the text at appropriate points and is elaborated below.

First, it should be recalled that the present study was restricted to black and white males, and that Mexican-American and Puerto Rican males and all females were excluded. As explained in chapter Two, data were not available in the DARP treatment population for all ethnic group by sex by treatment combinations. In fact, in the combined Cohort 1-2 sample, only two groups, black and white males, were represented in all four treatment modalities and the comparison (IO) group. Inasmuch as a major concern in this study was the comparison of treatments and this required using comparable subjects (as far as possible), there was no acceptable alternative to the restriction adopted.

Second, the research design for the covariance analysis comparing Post DARP outcomes for the five treatment groups (chapter Three) required complete data on all covariates (demographic, background, treatment history, and baseline measures) and criterion variables involved. Likewise, the hierarchical regression model for examining differential outcomes within each treatment group (chapters Four and Five) required complete data on all predictors (demographic, background, previous treatment, baseline, and, except in IO, during-treatment performance measures) and criterion variables involved. In addition to these requirements, a number of criterion measures were adjusted for time at risk; this led to some exclusions in the analysis of Pre- to Post DARP changes and the further sample reductions in the ANCOVA and regression studies (that is, data were included only for periods when the individuals were not confined in a jail, residential or inpatient facility, or hospital). Conformity with these requirements resulted in the elimination of numbers of individuals in almost every analysis and sometimes in the use of severaly reduced samples for major phases of the study. Although the effects of these procedures were evaluated and certain of them must be taken into account in interpretation of results, it is important that both the logic of these procedures and their effects be clearly understood. Information has been provided at appropriate places in this report to enable the critical reader to arrive at his/her own conclusions with respect to the significance of these issues relating to the research design.

Where uniform data were required for comparative study, as in the case of the representation of sex and ethnic groups in the sample, there was no alternative to exclusion of groups that were not represented in DARP. The justification of the sample design has been discussed elsewhere (Simpson & Joe 1977). In the final sample, those groups that could be included were at least minimally represented to enable generalization of the results obtained. Where complete data were required for analytical purposes, as in the ANCOVA and regression studies, the only possible alternatives were either to reduce the samples by eliminating subjects with incomplete data or to eliminate relevant variables. The second alternative was clearly not acceptable since the variables involved were considered essential to the analyses.

Sample exclusions for incomplete data included persons who were not sufficiently at risk Pre DARP to provide baseline data or Post DARP to enable calculation of criterion scores, but the most frequent cases of exclusion for missing data represented early DARP dropouts whose During DARP data were incomplete. It would have been possible to select the followup samples so that persons with Pre DARP and During DARP data limitations would not have been included in the study. This might have simplified the tasks of data management and analysis but the resulting biases might well have invalidated the overall research. The largest number of exclusions was required in the

regression analyses (mainly as a result of missing During DARP data); the sample reductions for the gross mean comparisons and the covariance analysis were less extensive. A systematic examination of reasons for making exclusions enabled some assessment of resulting bias, which in every case was found to be either nonsignificant or manageable in the interpretation of results. These analyses are reported in detail in appendix A.

Procedures for At Risk adjustments. As reported in the text, particular care has been taken throughout the DARP followup research to adjust the data analyzed for time at risk. The importance of doing so hardly requires justification; it is obvious that persons residing in a jail, a hospital, or a residential treatment program during a particular time period are less likely to use illicit drugs, be arrested, or to work than if they were free to go their own ways in the community. In general, adjustments were made for drug and alcohol use and employment by excluding reports for months during which persons were confined; furthermore, if persons were not at risk during the first year Post DARP for a minimum of at least 3 months they were excluded from analysis. Such adjustments were not appropriate and were not made for time in treatment or time in jail.

Two aspects of these adjustments require comment. The first concerns the method of calculation of time at risk. It is recognized that although confinement is a major source of restriction of individual freedom, there may be much variation among individuals and institutions in the amount of actual restriction. Further, confinement is not the only source of restriction. Persons on probation or parole, under bond or awaiting trial, suffering from physical illness but not hospitalized, and enrolled in schools, outpatient treatment programs, or other activities that involve direct or indirect surveillance by authorities illustrate additional sources. It was not feasible in the DARP research to individualize the calculation of time at risk and it was recognized that the adjustments made were approximate. This method also had the disadvantage of reducing sample size on a nonrandom basis when persons not at risk over an entire period were required to be excluded. This was recognized, as discussed above, and careful efforts have been made to evaluate the effects of such exclusions and to compensate for the biases found. Nevertheless, no satisfactory alternative method to accomplish the necessary adjustments has yet been discovered.

The second aspect of these adjustments deserving comment concerns the effect of not excluding time spent in outpatient treatment for the calculation of outcome measures. This issue was addressed in more detail in the section dealing with Pre DARP to Post DARP changes (chapter Three). There it was noted that some outcome scores, such as drug use and criminality indicators, were probably biased in the favorable direction to the extent that they were computed for months while the person was in treatment. That is, participation in or being under the general supervision of a treatment program tends to exert a favorable influence on client behaviors (Gorsuch et al. 1976; Savage & Simpson 1977). Analyses designed to assess the apparent impact of this source of bias on the present data were reported in chapter Three and the results indicated that the bias did not affect the general findings of the study. Appropriate adjustments for time in treatment would be extremely difficult to implement without introducing other methodological problems, but under such a plan the two groups found to have had the most unfavorable Post DARP outcomes (i.e., DT and IO) would probably have had even poorer outcome records in comparison to the other groups.

Rationale for selecting a 1-year Post DARP criterion period. The decision to restrict the present study to first year (Post DARP) outcomes, even though up to 6 years of followup data were available for some persons, was explained in chapter One. The first reason for this decision was methodological in that a 1-year time interval allowed a uniform evaluation period for all

clients in the sample, and in that respect it equated the length of time used for measuring outcomes. Another substantive reason was that the first year following DARP treatment was judged to be an optimal time for evaluating treatment effects that would be least confounded by other factors, such as return to other treatments, incarcerations, etc. Although strengths as well as potential weaknesses were recognized in this approach, the design was balanced in the context of other studies of the DARP followup data involving Post DARP intervals beyond the first year. Additionally, it was found that even though most of the followup sample had data beyond the first year Post DARP, the outcome scores tended to be highly consistent over time. Thus, evaluation of Year 1 data was expected to generalize in many ways to later time periods. As shown in the following tabulation, the correlations found among outcome measures over the 3 years following DARP in Cohorts 1 and 2 illustrates this general trend.

Outcome Measure	Correlations Between Years Post DARP		
	Yr1-Yr2	Yr2-Yr3	Yr1-Yr3
Opioid Use	.75	.76	.56
Nonopioid use	.79	.80	.63
Marihuana use	.90	.93	.82
Alcohol use	.87	.88	.78
% Year Employed	.70	.70	.49
Any Jail	.51	.57	.37
Any Treatment	.56	.59	.35

Changes Following DARP Treatment on Specific Criteria

The Pre DARP and Post DARP means and mean differences for each treatment group on each of nine criteria are summarized in chapter Three (table 6). Significance tests were computed for the differences with respect to six of the criteria -- Opioid Use, Nonopioid Use, Marihuana Use, Alcohol Use, Months Employed, and Arrest Rate per year; tests of significance were not computed for Any Employment, since months employed was a more precise measure, and tests were not appropriate for Any Jail and Any Treatment, for which the Pre DARP (lifetime) measures could not be suitably compared with the Post DARP measures.

The data presented in table 6 represent gross change, unadjusted for any population or other pretreatment characteristics of the client samples. These results showed a significant ($p<.01$) Pre DARP to Post DARP reduction of opioid use in all five treatment groups, which was greatest in MM and TC and smallest in DF, which had the lowest Pre DARP level; DT and IO were in between. Since the mean Pre DARP opioid use levels in MM and DT were about equal, the fact that the MM difference was approximately 50 percent greater than that for DT is of special interest in view of the general results obtained. Significant but smaller decreases occurred on nonopioid use in MM, TC, and DF; these were greatest in TC and DF. Similarly, employment increased significantly in MM, TC, and DF (most in TC), and arrests decreased significantly only in MM. Contrary to the favorable changes on opioid and nonopioid use, employment, and arrests, the changes observed for marihuana use and alcohol use were relatively small but both were in the direction of increased use. The increase on marihuana was significant only in MM, and on alcohol, in all groups except DF.

For the five treatment groups, the gross results from Pre DARP to Post DARP (first year) reflect the following pattern of change:

DARP MM Clients--Significant favorable changes on:
- Opioid use (greatest among the five groups)
- Nonopioid use
- Employment
- Arrest rate.

Significant unfavorable changes on:
- Marihuana use
- Alcohol use.

DARP TC Clients--Significant favorable changes on:
- Opioid use
- Nonopioid use (greatest among the five groups)
- Employment (greatest among the five groups).

Significant unfavorable change on:
- Alcohol use.

No significant changes on:
- Marihuana use
- Arrest rate.

DARP DF Clients--Significant favorable changes on:
- Opioid use
- Nonopioid use
- Employment.

No significant changes on:
- Marihuana
- Alcohol use
- Arrest rate.

DARP DT Clients--Significant favorable change on
- Opioid use.

Significant unfavorable change on:
- Alcohol use.

No significant changes on
- Nonopioid use
- Marihuana use
- Employment
- Arrest rate.

DARP IO Clients--Significant favorable change on:
- Opioid use.

Significant unfavorable change on:
- Alcohol use.

No significant changes on:
- Nonopioid use
- Marihuana use
- Employment
- Arrest rate.

Thus, the reduction of opioid use was a general, favorable result in all groups, although as pointed out in chapter Three, the magnitude of these decreases was significantly larger in the MM and TC groups than in DF, DT, and IO. Alcohol use increased significantly in all of the groups except DF, the

group with the highest mean level of Pre DARP alcohol consumption. As suggested by the findings of Simpson and Lloyd (1976), however, the increases in Post DARP alcohol use apparently are associated primarily with persons who changed from nondrinkers (near zero ounces of 80-proof liquor equivalent per day) in the 2 months before DARP to light or moderate drinkers (1-8 ounces per day) after DARP; they found essentially no change in the percentage of heavy drinkers (over 8 ounces per day) from Pre DARP to Post DARP. In a related study by Simpson and Lloyd (1977), Post DARP alcohol and marihuana use were positively correlated. Similar finding in the present study showed that there was a slight increase in marihuana use from Pre DARP that paralleled the alcohol increase; the increased marihuana use was observed in every group except TC, but the increase was statistically significant only in MM. Finally, the results for DT and IO, apart from an opioid decrease and alcohol increase, were not significant on the other criteria.

Comparisons of Adjusted Post DARP Outcomes Across Groups

As discussed above, there were group differences in the magnitude and patterns of change involving Pre DARP to Post DARP outcomes, but at least in part these were considered to reflect population differences in degree of Pre DARP deviance and prognosis for rehabilitation as well as effects of treatment. The covariance analysis in the latter part of chapter Three was designed to compare the Post DARP means of the five treatment groups with the population factors statistically controlled. The results of that analysis were presented in tables 6 and 7 and in figure 4.

The assessment of change on the raw group means focused on Pre- to Post DARP differences, within treatment groups. The covariance analysis, on the other hand, did not address the amount of change but rather whether there were differences between the treatment group Post DARP means, after adjustment for linear dependencies on age, ethnic group, background, baseline, and treatment history scores. In this analysis there were significant differences on eight criteria -- opioid use, nonopioid use, marihuana use, employment, jail, any treatment, months in treatment, and months unsupervised, but not on alcohol use.

Separate paired comparisons of adjusted Post DARP means were computed for each of the eight criteria in which significant between-group differences were indicated by the covariance analysis. The results of these paired comparisons identified groups with adjusted mean scores that were significantly different from one another ($p<.01$). These data are summarized below (based on figure 4 in chapter Three) by indicating groups with the highest scores (High) on each criterion measure, the groups with the lowest scores (Low), and groups with intermediate scores (Mid). Groups denoted by high scores on a measure were not significantly different from one another, but did differ significantly from groups with low scores. Groups with intermediate scores did not differ significantly from any group with either high or low scores.

	DARP Treatment Group				
Outcome Criterion	MM	TC	DF	DT	IO
Opioid use	Low	Low	Low	High	High
Nonopioid use	Low	Low	Low	High	High
Marihuana use	High	Low	High	Mid	High
Employment	High	High	High	Low	Low
Any time in jail	Low	Mid	High	High	High
Any treatment	High	Low	Low	High	High
Months in treatment	High	Low	Low	Low	Low
Months unsupervised	Low	High	Mid	Mid	Low

In the interpretation of these results several points need to be considered. First, the eight variables listed are not independent. The two treatment variables and the number of months unsupervised are confounded and reflect differentially on MM (and IO to a lesser extent) in which return to treatment (mainly Post DARP MM) was highest, and on TC (and DF to a lesser extent) in which return to treatment was lowest. Return to MM treatment can also be regarded as consistent with the rationale of MM treatment held by some treatment directors and staff members in MM programs.

This leads to a second point, namely that the interpretation of results should take account of goals and ideological positions associated with various treatment approaches and presumably emphasized in different treatment programs. One of these positions is the endorsement of indefinite continued maintenance, at least for those persons who are unable to detoxify comfortably, that appears to be prominent in some MM programs (e.g., Dole & Nyswander 1977). Another reflects attitudes toward drug and alcohol use. It appears that marihuana use and alcohol use have not been the object of the same adverse concern on the part of treatment staffs as opioids and the major nonopioid drugs, and also that occasional drug use ("chipping") may be tolerated in some treatment circles more than others. In this regard, no differences were found among the five treatment groups on the adjusted first year Post DARP alcohol means. Further, only one DARP treatment group, TC, in which total abstinence (from illicit drugs) has been a major ideological posture, had a favorable adjusted outcome mean on marihuana use.

With these points in mind, the major separation between the treatment modalities MM, TC, and DF (which showed generally favorable first year outcomes) and the short-term DT and the Intake Only comparison group (which showed generally unfavorable outcomes) stands out as the principal result of the covariance analysis. TC appears to have more favorable marks than MM or DF, but only if the value associated with total abstinence (except for alcohol) is accepted and the value implying that return to treatment is unfavorable is also accepted. These are not empirical issues, however. As a result, the final assessment of effectiveness based on the present data must be left to the value preferences of the reader. If allowances are made for value differences, both MM and TC had the most effective programs, judged by the outcome results, with DF a close second. If one insists on abstinence as a criterion, and keeping in mind that return to treatment is associated with inability to remain abstinent, then TC had the most favorable record.

Factors Associated with Post DARP Outcomes

The regression model described in chapter Four was the basis for five studies reported in chapter Five. The model was applied separately to each treatment group, for each of the 10 criteria, in the fixed order indicated in table 8. There were 14 predictors for the analyses of the MM, TC, and DF groups, but only 11 for DT and 9 for IO. For DT, two During DARP factors, Social Deviance and Alcohol-Marihuana Use, were omitted for reasons explained earlier, and for IO, all four During DARP variables were omitted. Also, the DT and IO groups included no predictor variable for treatment type.

The 10 outcome criteria included the same nine measures of drug and alcohol use, criminality, and treatment as used in the covariance analysis, plus a general composite variable developed by Hornick, Demaree, Sells, and Neman (1977). This composite outcome measure reflects a combination of specific outcome criteria but is correlated primarily with Post DARP opioid and nonopioid use, employment, and jail; these correlations ranged between .50 and .78 in the different DARP treatment groups (as shown in table B-7 of appendix B). Marihuana use was not included as a component of the composite score, and alcohol use and return to treatment had relatively low correlations with the

composite. The composite score is a weighted combination of several specific outcome criteria and, of course, does not account for all of the variance contained by the specific outcome measures. Thus, it is important to recognize the variations as well as similarities in the results for the specific outcome criteria and the composite score. The relationships of the predictor variables with these Post DARP outcome measures are summarized below for each DARP treatment group.

Methadone maintenance group. The predictors in table 16 that had significant relationships with the largest numbers of criteria were age at admission, background criminality, During DARP social deviance, and days in treatment. The following statements characterize the relationship observed. The most favorable composite outcomes occurred for former DARP MM clients who:

- Were older (over 27) at DARP admission,
- Had backgrounds involving low criminality and high social responsibility,
- Showed more favorable (and conforming) During DARP performance in terms of low social deviance, and
- Had relatively longer time (over 6 months) in treatment.

These results suggest that the most successful MM clients were more mature at admission and more highly socialized than those who had less favorable outcomes, and are similar to results for other populations reported in the mental health and correctional literature. Previous research based on during-treatment performance in the DARP is also consistent with these general findings in that older and more highly socialized clients tended to remain in treatment longer (Joe & Simpson 1976) and to have more favorable performance indicators (Gorsuch et al. 1976). Together, these findings point to pretreatment maturity and conformity to societal norms as being related to treatment success, but the followup data show that during-treatment performance is an additional significant factor to consider even after taking into account these pretreatment variables. This is an important result and suggests that more favorable indicators during the course of treatment (regardless of the pretreatment characteristics of clients) is related to more favorable outcomes after leaving treatment. The present data do not necessarily establish treatment as the causal factor in this relationship, however, since the effects due to client motivation, adaptability of certain types of clients to certain types of treatments, and other factors may be involved. Nevertheless, the clear indication is that success during treatment predicts success after treatment.

Therapeutic community group. As shown in table 17, only days in treatment (During DARP) was significantly related to a number of criteria in the TC group. However, social deviance during treatment was also related to opioid use and the composite score. These relationships are important and of particular interest since the residential environment of the therapeutic community is isolated and clients are believed to be minimally at risk during TC treatment. In general, DARP TC clients who had the most favorable composite Post DARP outcomes:

- Showed low social deviance During DARP,
- Remained in treatment longer (over 3 months), and
- Had more favorable terminations.

The remaining relationships also reflect some interesting patterns: older clients were less likely to use marihuana after DARP, but more likely to have further treatment; high background social responsibility was associated with low marihuana use and high Post DARP employment; and low baseline nonopioid use was associated with low Post DARP nonopioid use and marihuana use.

CONTINUED

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Table 16

Client and Treatment Characteristics Associated with Favorable Outcomes in the DARP Methadone Maintenance Sample

	Significant Relationships of Predictor Variables with Favorable Scores on Outcome Measures for Year 1 After DARP							
	Opioid Use	Nonop. Use	Mari. Use	Alc. Use	Employ-ment	Any Jail	Any Trt.	Composite Score
Demographic:								
Ethnic Group	--	--	--	--	--	--	Black	--
Age at Admission	Older	--	Older	--	--	Older	--	Older
Background:								
Criminality	Low	Low	--	--	--	Low	--	Low
SES	--	--	--	--	--	High	--	--
Social Resp.	--	--	--	--	High	--	--	High
Previous Treatment:								
Chemical	--	--	--	--	--	--	None	--
Non-Chemical	--	--	--	--	--	--	--	--
Pre DARP Baseline:								
Nonopioid Use	--	--	Low	--	--	--	--	--
Street Addiction	Low	--	Low	--	--	--	--	--
DARP Trt. Type:								
Type of MM	--	--	--	MM-A	--	--	--	--
During DARP Performance:								
Social Deviance	Low	Low	--	--	Low	--	--	Low
Alc-Mari. Use	--	--	Low	Low	--	--	--	--
Days in Trt.	High	--	--	High	--	--	--	High
Type of Termination	--	--	--	--	--	Favor.	--	--

Table 17

Client and Treatment Characteristics Associated with Favorable Outcomes in the DARP Therapeutic Community Sample

	Significant Relationships of Predictor Variables with Favorable Scores on Outcome Measures for Year 1 After DARP							
	Opioid Use	Nonop. Use	Mari. Use	Alc. Use	Employ-ment	Any Jail	Any Trt.	Composite Score
Demographic:								
Ethnic Group	--	--	--	--	--	--	--	--
Age at Admission	--	--	Older	--	--	--	Younger	--
Background:								
Criminality	--	--	--	--	--	Low	--	--
SES	--	--	--	--	--	--	--	--
Social Resp.	--	--	High	--	High	--	--	--
Previous Treatment:								
Chemical	--	--	--	--	--	--	--	--
Non-Chemical	--	--	--	--	--	--	--	--
Pre DARP Baseline:								
Nonopioid Use	--	Low	Low	--	--	--	--	--
Street Addiction	--	--	--	--	--	--	--	--
DARP Trt. Type:								
Type of TC	--	--	--	--	--	--	TC-T	--
During DARP Performance:								
Social Deviance	Low	--	--	--	--	--	--	Low
Alc-Mari. Use	--	--	--	--	--	--	--	--
Days in Trt.	High	High	--	--	High	High	High	High
Type of Termination	--	--	--	--	--	--	--	Favor.

Drug free group. Table 18 shows that DARP DF clients with the most favorable composite Post DARP outcomes:

- Had low background criminality,
- Showed low social deviance During DARP, and
- Remained in DARP treatment relatively longer (over 2 months).

Other notable relationships were that persons who had no Pre DARP MM or DT (Chemical) treatment tended to have lower Post DARP drug use (opioid and nonopioid) and be less likely to reenter treatment after DARP. Also, those with low baseline street addiction had fewer Post DARP jail episodes.

Detoxification group. The results for DARP DT clients, summarized in table 19, showed only that (low) background criminality was associated with favorable outcomes on the composite score. A few other scattered results appear in the table, but these require no special comment.

Intake only group. The results for this group are shown in table 20. The persons with the most favorable composite scores for the first Post DARP year were those who:

- Had low background criminality, and
- Had low baseline street addiction.

Comparison of Regression Results Across Treatment Groups

Although the pattern of results in the regression analyses was frequently specific to the criterion being evaluated and the treatment group involved, there were also several predictor-criterion relationships that showed consistency across the analyses. These are important to consider since they strengthen the generalizability of the findings. The results of the regression analyses are summarized in table 21, which shows for each DARP treatment group the predictor variables that were statistically significant; these results are shown separately for eight major outcome measures (Months in Treatment and Months Unsupervised are not included because of their similarity and overlap with Any Jail and Any Treatment).

Table 21 shows that ethnic group (represented in this study by black and white males) was not significantly related to the composite score in any of the DARP treatment groups. This finding was also consistent with the results of a separate hierarchical regression analysis on the composite score involving a portion of the followup sample not included in the present study. In particular, the subsample of Puerto Rican and Mexican-American males was combined with black and white males in the MM treatment group for a special analysis of ethnic group, with the first year Post DARP composite score as the criterion. In that analysis there were no significant ethnic group differences in overall outcomes. A similar analysis for black and white males and females in the MM treatment group also showed no significant sex differences in relation to the composite score.

Although there were no significant ethnic group differences in relation to the composite score, this was not true of the results for individual outcome measures. A rather consistent finding, for instance, was that the rate of return to drug treatment after DARP (Any Treatment) was significantly lower among blacks than whites in MM, DT, and IO. The fact that ethnic group was not significantly related to any other criteria is interesting and warrants further study. The present results indicate that even though black and white males did not differ with respect to Post DARP drug use, employment, or criminality, the whites for some reason had a significantly higher rate of return to treatment than the blacks. This difference could be related to

Table 18

Client and Treatment Characteristics Associated with Favorable Outcomes in the DARP Outpatient Drug Free Treatment Sample

	Significant Relationships of Predictor Variables with Favorable Scores on Outcome Measures for Year 1 After DARP							
	Opioid Use	Nonop. Use	Mari. Use	Alc. Use	Employ-ment	Any Jail	Any Trt.	Composite Score
Demographic:								
Ethnic Group	--	--	--	--	--	--	--	--
Age at Admission	--	--	--	--	--	--	--	--
Background:								
Criminality	Low	--	--	--	--	--	--	Low
SES	--	--	--	--	High	High	--	--
Social Resp.	--	--	--	--	--	--	--	--
Previous Treatment:								
Chemical	None	None	--	--	--	--	None	--
Non-Chemical	--	--	--	--	--	--	--	--
Pre DARP Baseline:								
Nonopioid Use	--	--	--	--	--	--	--	--
Street Addiction	--	--	--	--	--	Low	--	--
DARP Trt. Type:								
Type of DF	--	--	--	--	--	--	--	--
During DARP Performance:								
Nonop-Alc. Use	--	--	--	Low	--	--	--	--
Social Deviance	Low	Low	--	--	--	--	--	Low
Days in Trt.	High	High	--	--	--	High	--	High
Type of Termination	--	--	--	--	--	--	--	--

Table 19

Client and Treatment Characteristics Associated with Favorable Outcomes in the DARP Outpatient Detoxification Sample

	Significant Relationships of Predictor Variables with Favorable Scores on Outcome Measures for Year 1 After DARP							
	Opioid Use	Nonop. Use	Mari. Use	Alc. Use	Employ-ment	Any Jail	Any Trt.	Composite Score
Demographic:								
Ethnic Group	--	--	--	--	--	--	Black	--
Age at Admission	--	--	Older	--	--	--	--	--
Background:								
Criminality	Low	--	--	--	--	Low	--	Low
SES	--	--	Low	--	--	--	--	--
Social Resp.	--	--	--	--	--	--	--	--
Previous Treatment:								
Chemical	--	--	--	--	--	--	--	--
Non-Chemical	--	--	--	--	--	--	--	--
Pre DARP Baseline:								
Nonopioid Use	--	--	--	Low	--	--	--	--
Street Addiction	--	--	--	--	--	--	--	--
During DARP Performance:								
Days in Trt.	--	--	--	--	--	--	--	--
Type of Termination	--	--	--	--	--	--	Unfav.	--

Table 20

Client and Treatment Characteristics Associated with Favorable Outcomes in the DARP Intake Only Sample

	Significant Relationships of Predictor Variables with Favorable Scores on Outcome Measures for Year 1 After DARP							
	Opioid Use	Nonop. Use	Mari. Use	Alc. Use	Employ-ment	Any Jail	Any Trt.	Composite Score
Demographic:								
Ethnic Group	--	--	--	--	--	--	Black	--
Age at Admission	--	--	Older	--	--	--	--	--
Background:								
Criminality	--	--	--	--	--	Low	--	Low
SES	--	--	--	--	--	--	--	--
Social Resp.	--	--	--	--	--	--	--	--
Previous Treatment:								
Chemical	--	--	--	--	--	--	--	--
Non-Chemical	--	--	--	--	--	--	--	--
Pre DARP Baseline:								
Nonopioid Use	--	--	--	Low	--	--	--	--
Street Addiction	--	--	--	--	--	--	--	Low

Table 21

Summary of Regression Analyses Showing DARP Treatment Groups in which Predictor Variables were Statistically Significant.

Predictor Variables	Criterion Measures for First Year Post DARP: Opioid Use	Nonopioid Use	Marihuana Use	Alcohol Use	Employ-ment	Any Jail	Any Treatment	Composite Score
Demographic Variables:								
Ethnic Group	--	--	--	--	--	--	MM,DT,IO	--
Age	MM	--	MM,TC,DT,IO	--	--	MM	TC	MM
Background Factors:								
Criminality	MM,DF,DT	MM	--	--	--	MM,TC,DT,IO	--	MM,DF,DT,IO
Socioeconomic Status	--	--	DT	--	DF	MM,DF	--	--
Social Responsibility	--	--	TC	--	MM,TC	--	--	MM
Previous Treatment:								
Chemical	DF	DF	--	--	--	--	MM,DF	--
Non-Chemical	--	--	--	--	--	--	--	--
Pre DARP Baseline Factors:								
Nonopioid Use	--	TC	MM,TC	DT,IO	--	--	--	--
Street Addiction	MM	--	MM	--	--	DF	--	IO
DARP Treatment Type: (for MM,TC,DF Only)	--	--	--	MM	--	--	TC	--
During DARP Performance:[a]								
Social Deviance	MM,TC,DF	MM,DF	--	--	MM	--	--	MM,TC,DF
Alcohol-Mari. Use[b]	--	--	MM	MM,DF	--	--	--	--
Days in Treatment	MM,TC,DF	TC,DF	--	MM	TC	TC,DF	TC	MM,TC,DF
Favorable Termination	--	--	--	--	--	MM	DT	TC

[a]These four predictors were not applicable to the IO group, and only the last two were available for the DT group.

[b]This variable is labeled Nonopioid-Alcohol Use for the DF group.

treatment opportunities, motivation for seeking additional treatment, or other factors, but no explanation can be offered on the basis of the data presently available.

Age at DARP admission was significantly related to the outcome composite in MM, and to the individual measures for opioid use, marihuana use, and jail. On each measure, older persons (over the average of 27 in MM) tended to have more favorable Post DARP outcomes. Although age was not related to composite outcomes in any other treatment groups, it was consistently related to marihuana use within every treatment group, and significantly in all but DF. Specifically, older persons (at DARP admission) reported lower marihuana use after DARP than their younger counterparts. However, as reported earlier, there was a small overall increase in marihuana use in most treatment groups from Pre DARP to Post DARP.

Background criminality was significantly related to Post DARP opioid use, jail, or both in all treatment groups, and it was also significantly related to the composite in all groups except TC. The relationship of the other background factors, representing socioeconomic status and social responsibility, varied across treatment groups and criteria.

History of previous treatments (before DARP) and the baseline factors at admission were each limited in their generalizability across treatment groups and criteria. DARP MM and DF clients who had no MM or DT (Chemical) treatments before DARP tended to have lower rates of Post DARP treatment, compared to those who had been in MM or DT treatments Pre DARP. The relationships of baseline measures were generally specific to particular criteria and to treatment groups.

Type of DARP treatment within the MM, TC, and DF modalities typically showed no significant relationship to outcomes. In view of the systematic differences in respect to goals, policies, procedures, staff, and clients that were generally observed between treatment types in each of the modalities, these results were not anticipated. Further study of outcome variations within treatment types appear warranted to determine the consistency of results across the different DARP treatment programs according to the similarity of client characteristics, treatment features, and community context variables.

Probably the most consistent result across the MM, TC, and DF groups was that during-treatment performance in DARP served as a good indicator of Post DARP outcomes: DARP tenure (Days in Treatment) and the major during-treatment performance index (Social Deviance) were most consistently related to Post DARP outcomes. Both of these predictors were significantly related to opioid use as well as the composite score in each of the three groups; one or more of the During DARP predictors was significantly related to at least four of the specific outcome criteria in each group.

In summary, favorable scores on the general index of during-treatment performance (Social Deviance) and longer tenure in treatment were predictive of favorable Post DARP outcomes for DARP MM, TC, and DF clients; these during-treatment variables were not applicable for the short-term DT and IO (no DARP treatment) groups. Scores representing low background criminal history were also related to favorable composite outcomes in every group except TC, and even in TC they were related to the specific outcome measure representing jail. Thus, criterion performance during DARP treatment -- especially the general index of deviancy in treatment and length of time in treatment -- and a background index of criminal history were most consistently related to posttreatment outcomes in the major DARP treatment modalities.

CHAPTER SEVEN -- IMPLICATIONS OF FINDINGS

This study has shown general improvements on the major criteria from Pre DARP to the first year Post DARP for the DARP MM, TC, and DF clients. The evidence was essentially negative for the DT and IO (no DARP treatment) clients, who showed generally smaller and nonsignificant improvement or no change at all. In view of the population differences among the five DARP treatment groups, direct group comparisons of Post DARP outcomes were regarded as inappropriate and adjustments were made to control statistically for Pre DARP characteristics. The results of this procedure clearly indicated that Post DARP outcomes were generally quite favorable for the treatment modalities MM, TC, and DF, and less than favorable for the DT and IO groups. Some interesting differences were found between MM, TC, and DF on specific criteria, but the judgment concerning which group had the "best" outcome depends on subjective factors and is not considered to be an empirical matter. The goals and philosophies of these treatment modalities are substantially different in many respects, and decisions concerning their relative success, based on outcome data, are dependent on the ideological positions and values of the reader. Using the most rigid criteria, including drug abstinence and no return to drug treatment, the TC group would probably be selected as having the most successful outcomes. On the other hand, these criteria are not universally accepted among advocates of methadone maintenance treatment. There are respected professionals in the field who do not view return to drug treatment and occasional drug use ("chipping") with the same negative connotations. The DT and IO groups were rather clearly identified as having the poorest outcomes in the first year Post DARP, but the choice of the group with the best outcomes is much more difficult.

As a methodological note to these group comparisons, it should also be added that even though the statistical adjustments made for Pre DARP differences between the groups reflected the best option available under the circumstances, the method did not provide a perfect solution. The ideal method for group comparisons of the type involved in the present research requires initially that assignments of clients to treatments be random; in most instances in the DARP programs this was not feasible and was regarded by many treatment staffs as unethical, as well. Statistical adjustment was the realistic alternative, and although the procedures employed were generally effective, they were not equivalent to the procedure of random assignment. The field procedures actually used in treatment assignments often involved rather explicit rules (sometimes on the basis of Federal guidelines) and these resulted in systematic differences that were often difficult to address using statistical controls. A prominent case in point, for instance, was the systematic difference between the types of clients that were typically assigned to methadone maintenance and drug-free programs.

The regression analysis conducted in this study was designed to examine client and treatment characteristics associated with differential outcomes within each DARP treatment group. A substantial number of variables were identified that were significantly related to Post DARP outcomes; many of these were specific to outcome criterion measures and treatment group. The overall findings, nevertheless, suggested that persons who demonstrated low social deviance (especially criminality) before admission to DARP tended to have the best outcomes after leaving DARP treatment. This was also consistent with findings based on during-treatment DARP research in which such individuals also tended to perform better while in treatment (Gorsuch et al. 1976).

An important additional finding in the present study was that favorable performance During DARP (particularly on the general index of social deviance and the measure of time in treatment) was also predictive of favorable performance Post DARP. This relationship was highly consistent in MM, TC, and

DF, the only groups among the five compared in which all of the during-treatment variables were available. It is significant that the analytic model used (a hierarchical step-down regression analysis) indicated that this relationship held even after controlling for all of the demographic and other Pre DARP measures included in the analyses.

The implication that more favorable during-treatment results beget better posttreatment outcomes is interesting and deserves further consideration. As discussed previously, regression analysis does not establish causal relationships and caution is appropriate before adopting as fact the attractive hypothesis that it is the treatment that causes the favorable outcomes. Obviously, these data are also consistent with other hypotheses and these cannot be separated easily from the issue of treatment effectiveness. For example, the notion that client motivation is a key factor in treatment success is consistent with the present results. That is, a person motivated to benefit from his or her treatment experiences might be expected to perform well during and after treatment, and this could be relatively independent of treatment effectiveness per se. Likewise, the appropriateness of assignment of certain types of clients to certain types of treatment also demands consideration. To the extent that effective matching of client types and treatment types plays a role in treatment success, this issue might also be relevant to the present study. The relative importance of each of these possible explanations, as well as others not mentioned, cannot be assessed in the present results. For whatever causal explanations may be involved, however, the evidence clearly suggests that successful performance during treatment predicts more successful posttreatment outcomes.

As discussed earlier, significant improvements were generally observed from Pre DARP to Post DARP in the major DARP treatment modalities, MM, TC, and DF, and the Post DARP outcomes of these treatment groups tended to be significantly better than those of the DT and IO groups. Further, the During DARP performance indicators were related to posttreatment outcomes. However, the findings based on regression analyses within the MM, TC, and DF modalities generally did not indicate that specific treatment types (defined by different treatment approaches in each modality) were involved as significant variables in predicting Post DARP outcomes.

The fact that treatment type (MM-CO vs. MM-A, TC-T vs. TC-ST&M, and DF-CO vs. DF-A) was not significantly related to most Post DARP outcome indicators in the analyses reported is an interesting result. The prototypes of these treatment orientations involve very different goals and philosophies of treatment, but the present data generally did not distinguish between them in regard to outcome differences. It should be noted, on the other hand, that treatment programs can be more accurately described as representing different points along various continua defined by complex classificatory treatment dimensions. Few "pure" treatment types exist, even though the concept of treatment classification and previous efforts to quantify treatment processes (Cole & Watterson 1976) have been well received by many drug treatment authorities. Further work in this area is needed before any conclusions are warranted that treatment orientation is not related to posttreatment outcomes. In particular, further study is indicated in the present followup data involving outcome variations and overall goals and philosophies between different treatment programs.

The results reported in this paper are based on black and white males admitted to DARP during 1969-1972 (Cohorts 1 and 2), and Post DARP outcomes analyzed were limited to the first year after leaving DARP treatment. Evidence has been cited in the text which suggests that these data can be expected to generalize to other population groups and later Post DARP followup intervals. For instance, selected analyses of followup data available in the DARP

MM group on additional sex and ethnic subsamples indicated there were no significant differences related to these factors in regard to Post DARP composite measures. With respect to the generalizability of data from the first year Post DARP to later years, correlations of measures over time have shown a relatively high degree of consistency from one year to the next. This should not be interpreted to mean, however, that population group differences or time-related changes in the years following DARP were nonexistent. Indeed, there were significant differences between sex and ethnic groups on specific measures (e.g., criminality and employment), as well as potentially important variations in outcomes over time (especially in relation to other Post DARP treatments), that deserve further study. It has been pointed out previously that the present report is only one of a series of evaluation studies in the DARP research program and together these studies will address a number of issues such as those mentioned above. The present study has focused on several specific aspects of a very broad and extremely complex set of issues concerning evaluation of treatment effectiveness, and it is believed that it provides useful and generalizable indications of treatment effects and client characteristics related to posttreatment outcomes.

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APPENDIX A

Analysis of Sample Exclusions

The present study of posttreatment outcomes in the first year after DARP is based on a series of analyses which involve different kinds of data requirements. Even though the followup sample includes 2178 black and white males, most of the analyses required some exclusions to be made; the reason and extent of these exclusions depended on the purpose and method of analysis. The following discussion explains the reasons for making exclusions in each analysis and the number of cases involved, and describes a set of statistical tests designed to assess the potential impact of these exclusions on the generalizability of findings in the study. The first section lists the specific reasons for exclusions and the number of cases associated with each, while the second section presents the total numbers of exclusions required by each of the major analyses presented in chapters Three, Four, and Five. The results of comparisons between the excluded and the nonexcluded samples are reported in section three, and the implications of these findings are examined in the last section.

Reasons for Sample Exclusions

The analyses in the present study involved combinations of five basic reasons for sample exclusions: (1) not at risk Pre DARP, (2) not at risk Post DARP, (3) missing data on any of the background variables, (4) missing data on any of the Pre DARP baseline measures, and (5) missing data on any of the During DARP performance measures. As noted in the text, "not at risk" in the Pre DARP period meant living mainly in a jail, hospital, or therapeutic community during the 2 months before admission to DARP treatment; "not at risk" in the first year Post DARP meant having less than 3 months when the major place of residence was not a jail, hospital, or residential treatment facility. The other three sets of variables were taken from DARP Admission and Status Evaluation Records; chapter Three describes these measures in detail and the technique used (i.e., principal components analysis) to reduce the original variables within each set to composite indices. In each of these analyses, missing data on any one of the original variables resulted in missing data for the final composite indices.

The number of cases in the Cohort 1-2 sample of black and white males (N=2178) associated with each of these five reasons for exclusions is shown below for each DARP treatment group.

	MM	TC	DF	DT	IO	Total
Not At Risk in:						
1. Pre DARP	32	97	11	2	8	150
2. Post DARP	46	13	32	6	20	167
Any Missing Data for:						
3. Background	46	120	45	21	16	248
4. Baseline	15	22	28	11	7	83
5. During DARP	121	196	64	(not applicable)		381
Original Sample:	821	735	289	174	159	2178

An important point to make regarding these numbers is that the categories are not mutually exclusive. That is, the same individuals could have had more

than one reason for being excluded. This is illustrated best by considering persons who were not at risk Pre DARP (category 1); in these cases; baseline data (category 4) representing this period of time while the person was not at risk was frequently marked "not applicable" and coded as missing.

The table above indicates that 150 persons were not at risk Pre DARP, and 167 Post DARP. The number of persons not at risk Post DARP was higher than for Pre DARP in all treatment groups except TC, and although not shown in the table, there was only a small number of persons who were not at risk both Pre- and Post DARP (6 in MM, 10 in TC, 1 in DF, 0 in DT, 2 in IO, and 19 for all groups combined). A total of 248 persons had missing data for background measures, 83 for baseline measures, and 381 for during-treatment performance measures. Especially in view of the fact that the largest missing data category (5, for During DARP) applied only to the MM, TC, and DF groups, this was a major reason for exclusions in the present study. The combinations of these five reasons for sample exclusions required by the different sets of analyses is discussed further in the next section.

Analytic Model and Data Requirements

The three sets of analyses in the present study addressed (1) changes in criterion measures from Pre DARP to the first year Post DARP, (2) comparisons of Post DARP outcomes between groups (after statistical adjustments were made for population differences), and (3) pretreatment and during-treatment variables related to differential Post DARP outcomes within each DARP treatment group. The sets of variables involved were different from one type of analysis to another, and this required that different rules for sample exclusions be adopted for each analysis. The statistical models, the types of variables used, and the sample exclusions required in each of these analyses are described separately below.

Changes in Pre DARP to Post DARP criterion levels. Profile analysis (Morrison 1967) and matched sample *t* tests used in the examination of changes from before to after DARP were less demanding than the other two sets of analyses in terms of exclusions required. The only data involved in the Pre DARP to Post DARP comparisons were the outcome criteria and the only requirement was that persons be excluded if they could not be regarded "at risk" in relation to each particular measure. With regard to measures of drug (and alcohol) use and employment, therefore, persons not at risk in either Pre DARP or Post DARP had to be excluded from the sample. Computation of Pre DARP arrest rate was based on lifetime data and was not invalidated by Pre DARP risk status, but it could not be calculated for persons not at risk Post DARP; thus, exclusions for not at risk Post DARP were necessary on the arrest rate measure. (No exclusions related to risk status were made for tabulations of jail and treatment in the Pre DARP and Post DARP periods but -- as explained in the text -- these two measures were not analyzed.) The sample sizes after exclusions are shown below for the analyses conducted in each DARP treatment group.

	MM	TC	DF	DT	IO	Total
Original Sample:	821	735	289	174	159	2178
Reduced Samples:						
Drug Use & Employ.	749	585	249	166	133	1880
% of Orig. Sample	91%	80%	86%	95%	84%	86%
Arrest Rate	777	673	257	168	139	2014
% of Orig. Sample	95%	92%	89%	97%	87%	92%

Comparisons of outcomes for DARP treatment groups. Before making comparisons of treatment groups on the basis of Post DARP outcomes, statistical adjustments were made for population differences in the groups using analysis of covariance (ANCOVA). The measures used as covariates included demographic variables, background factors, Pre DARP treatment history measures, and baseline factors, defined in chapter Four. Missing data for any of these measures required exclusion from the covariance analysis (there were no missing data for demographic variables and treatment history measures). Furthermore, persons not at risk Pre DARP were excluded since baseline measures (used as covariates) were not appropriate in this situation, and persons not at risk Post DARP were excluded in computing outcomes for drug (and alcohol) use and employment, as was done in previous analyses. No exclusions were required for Post DARP risk status (based on confinement in a jail, hospital, or residential treatment facility) for the outcome criteria representing jail and treatment reentries. Sample sizes after these exclusions are shown below for analyses conducted in each treatment group.

	MM	TC	DF	DT	IO	Total
Original Sample:	821	735	289	174	159	2178
Reduced Samples:						
Drug Use & Employ.	736	563	217	148	126	1790
% of Orig. Sample	90%	77%	75%	85%	79%	82%
Jail & Treatment	769	605	230	153	143	1908
% of Orig. Sample	94%	82%	82%	88%	90%	88%

Differential outcomes within treatment groups. Variables related to differential Post DARP outcomes within each treatment group were examined using a hierarchical step-down regression analysis, discussed in chapter Four. The same measures used in the ANCOVA described above (demographic, background, treatment history, and baseline) plus During DARP performance measures were included as predictor variables in the regression analysis. Likewise, the same exclusions made in the ANCOVA applied in the regression analysis, in addition to those associated with the added variables on during-treatment performance (since the during-treatment measures were applicable only to the MM, TC, and DF groups, however, it is noted that it was only in these groups that the numbers of exclusions changed from the ANCOVA). The exclusions, of course, included persons not at risk Pre DARP, and computations for outcome measures on drug use and employment (along with the composite score) did not include persons not at risk in the first year Post DARP. The Post DARP risk status was not used to make exclusions for the computation of jail and treatment outcome measures. Sample sizes resulting from these exclusions are summarized below for the analyses conducted in each treatment group.

	MM	TC	DF	DT	IO	Total
Original Sample:	821	735	289	174	159	2178
Reduced Samples:						
Drug Use & Employ.	653	474	182	148	126	1583
% of Orig. Sample	80%	64%	63%	85%	79%	73%
Jail & Treatment	682	510	200	153	143	1688
% of Orig. Sample	83%	69%	69%	88%	90%	78%

Analyses of the Excluded and Nonexcluded Samples

The strategy for the analyses presented below was to make group comparisons between the excluded and nonexcluded samples (using t tests) on measures for which data were available and could be appropriately compared. That is, since several reasons were involved in making exclusions, all persons who were excluded in the various analyses did not have missing data for all variables. This provided the opportunity to make several comparisons based on data that were not missing in the excluded sample. These comparisons involved all the measures available from Pre DARP, During DARP, and Post DARP outcomes.

Comparisons based on Pre DARP measures. Because of the relatively complex set of procedures required for making exclusions in the analyses of the present study, an extremely large number of group comparisons would have been necessary if each had been examined separately. Exclusions associated with some reasons involved only a small number of cases, however, and would not provide a sufficient sample size for any of the comparisons of interest. Thus, the plan adopted for making group comparisons was to compare persons who were excluded (for any of the five reasons described previously) with those who were not excluded. The Pre DARP measures that were examined included those used in the ANCOVA and regression analyses; these were demographic variables (Black and Age), Pre DARP background factors (Criminality, Socioeconomic Status, and Social Responsibility), previous treatment history (Chemical Treatment and Non-Chemical Treatment), and Pre DARP baseline factors (Nonopioid Use and Street Addiction), all defined in chapter Four of the text. The purpose was to determine if the excluded and the nonexcluded samples differed significantly on any of these Pre DARP measures.

A series of 45 t tests was computed, one for each of the nine Pre DARP measures within each of the five DARP treatment groups. All DARP clients had data for the demographic and treatment history variables, but not for the background and baseline variables. The range of the sample sizes used in the tests for Pre DARP measures between the excluded and nonexcluded samples in each DARP treatment group is summarized below.

	MM	TC	DF	DT	IO
Excluded Sample	120-166	139-259	62-107	5-26	17-33
Nonexcluded Sample	653	475	182	148	126

It is noted that a few of the samples (especially in DT) were too small to provide reliable estimates of Pre DARP measures for the group of exclusions, but most of the samples were sufficiently large. The results showed, however, that none of the 45 t tests were statistically significant ($p<.01$). That is, no evidence was found to indicate that the exclusions resulted in any bias insofar as could be determined with regard to Pre DARP population characteristics.

Comparisons based on During DARP measures. The same analytic strategy was applied to the During DARP measures as was used for Pre DARP data. Namely, gross comparisons were made between persons who had been excluded in any analysis and those who had not. The During DARP performance measures included the Social Deviance factor, the Alcohol-Marihuana Use factor (labeled Nonopioid-Alcohol Use in the DF group), Days in Treatment, and Type of Termination, all defined previously in chapter Four. The IO group spent no time in DARP treatment and therefore was not included in these analyses, and the DT group only had two of the four during-treatment measures available (Days in Treatment and Type of Termination).

A series of 14 t tests were used to compare these During DARP measures for the excluded versus the nonexcluded samples. Tests were conducted for each of these four measures in the MM, TC, and DF treatment groups, and for two (noted above) in DT. As was the case with regard to the Pre DARP demographic variables, all DARP clients had data on Days in Treatment and Type of Termination. For the other two measures (Social Deviance and Alcohol-Marihuana Use), on the other hand, the amount of missing data was extensive. In fact, missing During DARP data on these two measures accounted for 73 percent of the total excluded sample in MM, 76 percent in TC, and 60 percent in DF. The sample sizes available for examining these two measures (made up of persons excluded for reasons other than missing During DARP data), therefore, were relatively small. The samples used in making group comparisons are summarized below.

	MM	TC	DF	DT
Excluded Sample	45-166	63-259	43-107	26
Nonexcluded Sample	653	475	182	148

The comparisons involving Social Deviance and Alcohol-Marihuana Use included only 45 of the 166 persons excluded in MM, 63 of the 259 excluded in TC, and 43 of the 107 excluded in DF; these were the only clients with data available on these measures. Of these six comparisons (t tests) between the excluded and nonexcluded samples, only the one for Social Deviance in the MM treatment group was statistically significant ($p<.01$). The eight comparisons conducted for the other During DARP measures -- Days in Treatment and Type of Termination -- included data on all persons in the excluded samples in MM (n=166), TC (n=259), DF (n=107, and DT (n=26). The results showed that the excluded and nonexcluded samples were significantly different ($p<.01$) in five of the eight tests; these were for Days in Treatment in the MM, TC, and DF groups, and for Type of Termination in the MM and TC groups. The significant group differences on During DARP performance are summarized as follows.

- Social Deviance in MM -- The excluded sample had higher deviance (i.e., poorer during-treatment performance, $\bar{X}=.37$) than the nonexcluded sample ($\bar{X}=-.09$).

- Days in Treatment in MM, TC, and DF -- In each DARP group, the excluded sample had shorter tenure than the nonexcluded sample (3.7 vs. 5.2 in MM, 2.8 vs. 4.1 in TC, and 2.6 vs. 3.4 in DF).

- Favorable Terminations in MM and TC -- in both DARP groups, terminations were more unfavorable for the excluded sample than for the nonexcluded sample (1.27 vs. 1.51 in MM, and 1.34 vs. 1.62 in TC).

In summary, these findings indicate that the excluded samples in MM, TC, and DF each tended to be short-term clients with unfavorable terminations (e.g., "quitters"), and the excluded sample in MM also tended to have more deviant during-treatment performance scores.

Comparisons based on Post DARP outcomes. The results of the group comparisons reported above suggest that the excluded and nonexcluded samples were not significantly different in Pre DARP characteristics, but there were some differences in during-treatment measures (especially in tenure and favorableness of termination). It was therefore decided that the examination of outcome measures should take into account the reason for exclusion in order to

identify more precisely the type of exclusion leading to outcome differences that might exist. Persons who were not at risk Post DARP, of course, could not be included in the analysis of outcome measures representing drug (and alcohol) use and employment, but their data were available for measures in jail and treatment. As pointed out in an earlier section, however, persons not at risk Post DARP totaled to 167, while the most common reason for exclusions was missing data During DARP (n=381).

The strategy used in examining outcomes in the first year Post DARP was to compare excluded and nonexcluded samples in each of the DARP treatment groups on the basis of the 10 outcome criteria defined in chapter Four; these included Opioid Use, Nonopioid Use, Marihuana Use, Alcohol Use, Employment, Any Jail, Any Treatment, Months in Treatment, Months Unsupervised, and the Composite Score. These tests were conducted separately, however, for three major categories of reasons for exclusions; that is, separate outcome comparisons (t tests) were made for excluded and nonexcluded samples defined on the basis of (1) not at risk Pre DARP or missing baseline data (these two categories were combined because of their similarity and overlap), (2) missing Pre DARP background data, and (3) missing During DARP performance data (this category applied only to the MM, TC, and DF groups).

The number of t tests computed was 50 for each of the first two categories defining exclusions (one test for each of the 10 outcome criteria within each of the five treatment groups), and 30 for the third category (one test for each of the 10 outcome criteria in the MM, TC, and DF groups). Altogether, these totaled to 130 t tests. The numbers of persons included in the first set of these comparisons for samples defined by Pre DARP risk status and missing baseline data are shown below (the smaller sample sizes apply to the drug use, employment, and composite measures, while the larger numbers apply to the measures of jail, treatment, and months unsupervised).

	MM	TC	DF	DT	IO
(1) Not At Risk Pre DARP or Missing Baseline Data:					
Excluded Sample	39-43	104-113	34-39	12-13	11-14
Nonexcluded Sample	737-776	568-621	223-250	156-161	128-145

Of the 50 tests computed for this category of exclusions (10 tests in each treatment group), none were statistically significant ($p<.01$). Thus, no evidence was found to indicate that Post DARP outcomes differed significantly with regard to Pre DARP risk status or missing baseline data.

The numbers of persons included in the second set of comparisons of samples defined by missing background data are shown below.

	MM	TC	DF	DT	IO
(2) Missing Background Data:					
Excluded Sample	41-46	110-120	40-45	20-21	13-16
Nonexcluded Sample	735-773	562-614	217-244	148-153	126-143

The results of the 50 tests computed for this category of exclusions showed none of the differences on outcomes were statistically significant ($p<.01$). The findings paralleled those above, therefore, in that there was no evidence to suggest that Post DARP outcomes differed significantly with respect to missing Pre DARP background data.

The third set of comparisons was based on exclusions involving missing During DARP performance data. The numbers of persons included in the three DARP treatment groups examined (MM, TC, and DF) are shown below.

	MM	TC	DF
(3) Missing During DARP Data:			
Excluded Sample	112-121	178-196	58-64
Nonexcluded Sample	664-698	494-538	199-225

Out of the 30 tests computed based on these data, five were statistically significant ($p<.01$) and all involved the TC group. These results are summarized below.

- Opioid Use in TC -- The excluded sample had higher opioid use ($\bar{X}=2.2$) than the nonexcluded sample ($\bar{X}=1.8$).
- Employment in TC -- The excluded sample had a poorer employment score ($\bar{X}=1.1$) than the nonexcluded sample ($\bar{X}=1.3$).
- Jail in TC -- The excluded sample had a higher percentage that had been jailed (37 percent) than the nonexcluded (27 percent).
- Return to Treatment in TC -- The excluded sample had a higher percentage that had reentered treatment (37 percent) than the nonexcluded sample (27 percent).
- Composite in TC -- As a function of the differences found in the measures described above, the composite score was more unfavorable for the excluded sample ($\bar{X}=15.0$) than the nonexcluded sample ($\bar{X}=11.5$).

Although the outcome measures in all three DARP treatment groups tended to be more unfavorable among the samples with missing During DARP data, the differences were statistically significant only in TC. The findings noted above for the composite score in TC point out the overall consistency of the results for opioid use, employment, jail, and Post DARP treatments.

Implications of Findings on Sample Exclusions

A large number of tests were conducted in the comparisons of excluded and nonexcluded samples for the present study. Although a few significant results could be expected by chance when computing so many t tests, the overall findings appear to be rather clear and consistent. For instance, there was no evidence of bias in terms of demographic characteristics, Pre DARP background factors, treatment history, or Pre DARP baseline factors due to sample exclusions used in the present study.

The results did show, however, that During DARP performance measures deserve special attention as reasons for sample exclusions. The largest number of exclusions were associated with missing data on these measures, particularly the performance factors of Social Deviance and Alcohol-Marihuana Use, and it was found that these exclusions tended to have had fewer days in DARP treatment (in MM, TC, and DF) and to have had less favorable terminations (in MM and TC) than did persons not excluded. Comparisons of criteria measured during the first year Post DARP further showed that exclusions for missing During DARP data also had less favorable outcomes than those not excluded; this was statistically significant only in TC but was generally observed in the mean scores for MM and DF as well.

The net result of all these comparisons is that persons who were required to be excluded from analyses because of missing During DARP data had less favorable Post DARP outcomes than those on whom the analyses were computed; in general, these individuals had remained in DARP treatment for significantly shorter periods of time than those with complete data, and had less favorable terminations from DARP treatment. The apparent effect of these exclusions would be an increment in the overall favorability of Post DARP outcome scores computed in the present study. However, it should be pointed out that the analyses of Pre DARP to Post DARP changes in outcome levels as well as the comparisons of adjusted Post DARP outcomes between treatment groups, both reported in chapter Three, were not influenced in this manner since During DARP data were not involved in their exclusion procedures. Thus, the only analyses in this study which focused on overall outcome levels were not affected by this source of potential bias.

The regression analyses for examining differential outcomes within treatment groups, presented in chapter Five, did involve exclusions due to missing During DARP data. In this respect, nevertheless, it is interesting to note that the findings related to the excluded samples added confirmation to the results already reported in chapter Five, based on the sample with complete data. These results generally indicated that short-term clients in DARP (with fewer days in treatment) who performed poorly during DARP treatment (e.g., high social deviance) also tended to perform more poorly Post DARP. The effect of the exclusions was therefore positive in respect to the accuracy of the results reported and consistent with major results reported in chapter Five. The conclusion, therefore, is that in none of the analyses of this study does the generalizability of the results appear to be affected despite the magnitude of the exclusions required by the procedures followed.

APPENDIX B

Tables of Intercorrelations

Table B-1

Correlations Amongthe Covariates and DARP Treatment Groups Used in the Analysis of Covariance for Comparing Treatment Groups on Outcome Measures the First Year After DARP (N=1908, Black and White Males Only in Cohorts 1 and 2)

1.	Black	(1)											
2.	Age at Adm.	.17	(2)										
	Background:												
3.	Criminality	.01	.13	(3)									
4.	Low SES	.23	.26	.06	(4)								
5.	Low Soc. Resp.	-.05	-.52	-.01	.03	(5)							
	Previous Trt.:												
6.	Chemical	-.16	.12	.08	.06	.00	(6)						
7.	Non-Chemical	-.13	.01	.15	-.06	.00	.04	(7)					
	Pre DARP:												
8.	Nonop. Use	-.17	-.22	-.06	-.14	.17	-.06	.04	(8)				
9.	Street Addict.	.09	.01	.20	.17	.37	.09	.05	-.01	(9)			
	DARP Trt.:												
10.	MM	.07	.27	.07	.13	-.20	.06	-.06	-.21	.01	(10)		
11.	TC	-.04	-.17	.07	-.09	.16	-.05	.12	.13	.10	-.56	(11)	
12.	DF	-.05	-.14	-.14	-.08	.06	-.06	-.05	.16	-.17	-.31	-.26	(12)
13.	DT	-.01	.03	-.06	.01	-.05	.04	-.04	-.04	-.01	-.24	-.20	-.11	(13)
14.	IO	.00	-.04	-.02	.02	.06	.00	.01	.00	.02	-.23	-.19	-.11	.08

Table B-2

Correlations Among Predictor Variables in the Multiple Regression Analyses of Outcome Measures the First Year After DARP for the DARP MM Treatment Group (N=682, Black and White Males Only in Cohorts 1 and 2)

1.	Black	(1)												
2.	Age at Adm.	.10	(2)											
	Background:													
3.	Criminality	-.06	.13	(3)										
4.	Low SES	.25	.26	.02	(4)									
5.	Low Soc. Resp.	.01	-.42	-.01	.08	(5)								
	Previous Trt.:													
6.	Chemical	-.21	.09	.04	-.01	-.01	(6)							
7.	Non-Chemical	-.14	.04	.20	-.09	-.03	.06	(7)						
	Pre DARP:													
8.	Nonop. Use	.04	-.10	.01	-.07	.13	-.02	.03	(8)					
9.	Street Addict.	.11	-.03	.11	.25	.46	.01	-.01	.15	(9)				
	DARP Trt.:													
10.	MM-A	.00	-.19	.05	-.05	-.01	-.11	-.06	.08	-.09	(10)			
	During DARP:													
11.	Social Deviance	.02	-.13	.03	.05	.31	.02	-.09	.12	.30	-.05	(11)		
12.	Alc-Mari. Use	.06	.09	-.02	-.04	-.21	-.02	-.00	.02	-.05	-.12	.01	(12)	
13.	Days in Trt.	-.04	.13	.03	.02	-.14	.04	.03	-.05	-.07	-.18	-.27	.18	(13)
14.	Favorable Term.	-.06	-.04	-.00	-.05	-.08	-.02	.03	-.01	-.08	.02	-.20	.02	.24

Table B-3

Correlations Among Predictor Variables in the Multiple Regression Analyses of Outcome Measures the First Year After DARP for the DARP TC Treatment Group (N=510, Black and White Males Only in Cohorts 1 and 2)

1.	Black	(1)											
2.	Age at Adm.	.20	(2)										
	Background:												
3.	Criminality	.10	.15	(3)									
4.	Low SES	.24	.23	.10	(4)								
5.	Low Soc. Resp.	-.03	-.55	.02	.06	(5)							
	Previous Trt.:												
6.	Chemical	-.13	.15	.12	.07	-.03	(6)						
7.	Non-Chemical	-.12	.03	.11	-.03	.00	.04	(7)					
	Pre DARP:												
8.	Nonop. Use	-.20	-.13	-.05	-.11	.09	-.01	.02	(8)				
9.	Street Addict.	.08	.06	.24	.05	.32	.14	.06	-.07	(9)			
	DARP Trt.:												
10.	TC-T	.10	-.12	.03	.01	.08	-.02	.08	-.16	-.00	(10)		
	During DARP:												
11.	Social Deviance	-.03	.12	.02	.02	-.03	.07	-.02	-.04	.09	-.15	(11)	
12.	Alc-Mari. Use	-.08	-.04	-.01	-.03	-.04	.03	.01	.17	-.11	-.20	-.02	(12)
13.	Days in Trt.	-.05	-.02	.05	-.07	.03	.02	.10	.02	.03	.08	-.12	.07
14.	Favorable Term.	-.08	.00	.01	-.10	-.03	.03	.07	.02	.04	-.01	-.10	.01

Table B-4

Correlations Among Predictor Variables in the Multiple Regression Analyses of Outcome Measures the First Year After DARP for the DARP DF Treatment Group (N=200, Black and White Males Only in Cohort 2)

1.	Black	(1)											
2.	Age at Adm.	.10	(2)										
	Background:												
3.	Criminality	.01	-.10	(3)									
4.	Low SES	.22	.14	-.01	(4)								
5.	Low Soc. Resp.	-.01	-.53	.09	.08	(5)							
	Previous Trt.:												
6.	Chemical	-.14	.10	.10	.19	.11	(6)						
7.	Non-Chemical	-.06	-.05	.14	.06	-.04	.09	(7)					
	Pre DARP:												
8.	Nonop. Use	-.23	-.26	-.14	-.18	.09	-.15	.09	(8)				
9.	Street Addict.	.05	-.07	.27	.19	.39	.22	.08	-.12	(9)			
	DARP Trt.:												
10.	DF-A	.05	.02	-.05	.00	-.00	.00	.04	.02	.09	(10)		
	During DARP:												
11.	Nonop-Alc. Use	-.16	-.06	-.13	-.06	.08	-.06	-.02	.17	-.15	-.05	(11)	
12.	Social Deviance	.22	.07	.16	.22	.15	.13	.12	-.29	.43	-.02	-.02	(12)
13.	Days in Trt.	-.18	-.12	-.13	-.11	.05	-.06	-.05	.22	-.27	-.00	.15	-.44	(13)
14.	Favorable Trt.	-.14	-.11	-.07	-.07	.04	-.06	.09	.20	-.09	-.05	-.03	-.22	.33

Table B-5

Correlations Among Predictor Variables in the Multiple Regression Analyses of Outcome Measures the First Year After DARP for the DARP DT Treatment Group (N=153, Black and White Males Only in Cohorts 1 and 2)

1. Black	(1)									
2. Age at Adm.	.17	(2)								
Background:										
3. Criminality	-.15	.13	(3)							
4. Low SES	.01	.20	.08	(4)						
5. Low Soc. Resp.	-.25	-.43	.02	.04	(5)					
Previous Trt.:										
6. Chemical	-.23	.00	.12	.14	.13	(6)				
7. Non-Chemical	-.22	.08	.18	-.05	.08	.09	(7)			
Pre DARP:										
8. Nonop. Use	-.11	-.14	.05	-.06	.11	-.02	-.04	(8)		
9. Street Addict.	-.07	-.08	.13	.30	.44	.10	.01	.13	(9)	
During DARP:										
10. Days in DARP Trt.	-.03	.03	.00	.01	-.08	.03	.07	.07	.00	(10)
11. Favorable Term.	-.02	.01	-.04	-.20	-.12	.07	-.05	.12	-.01	.14

Table B-6

Correlations Among Predictor Variables in the Multiple Regression Analyses of Outcome Measures the First Year After DARP for the DARP IO Comparison Group (N=143, Black and White Males Only in Cohorts 1 and 2)

1. Black	(1)							
2. Age at Adm.	.13	(2)						
Background:								
3. Criminality	.07	.13	(3)					
4. Low SES	.24	.22	.06	(4)				
5. Low Soc. Resp.	.09	-.43	-.05	.08	(5)			
Previous Trt.:								
6. Chemical	-.17	.13	.11	-.08	-.06	(6)		
7. Non-Chemical	-.14	.00	.04	-.09	-.10	-.13	(7)	
Pre DARP:								
8. Nonop. Use	-.38	-.25	-.11	-.19	.17	-.10	.03	(8)
9. Street Addict.	.16	.04	.21	.13	.40	.02	-.08	-.14

Table B-7

Correlations Among the Outcome Measures for the First Year After DARP Within Each Treatment Group

DARP Methadone Maintenance (N=748)

1. Opioid Use	(1)								
2. Nonop. Use	.41	(2)							
3. Mari. Use	.12	.22	(3)						
4. Alcohol Use	-.03	.08	.06	(4)					
5. Employment	-.19	-.15	-.01	.03	(5)				
6. Jail	.24	.19	.08	.06	-.18	(6)			
7. Any Trt.	-.02	.09	.01	-.04	-.04	-.02	(7)		
8. Mo. in Trt.	-.14	.01	-.00	-.07	-.00	-.14	.84	(8)	
9. Mo. Unsup.	.06	-.07	-.02	.06	.07	-.13	-.81	-.92	(9)
10. Composite	.72	.62	.17	.05	-.52	.52	.22	.06	-.22

($r = \pm .09$, $p < .01$)

DARP Therapeutic Communities (N=584)

1. Opioid Use	(1)								
2. Nonop. Use	.34	(2)							
3. Mari. Use	.16	.36	(3)						
4. Alcohol Use	-.07	.13	.16	(4)					
5. Employment	-.35	-.24	-.15	-.00	(5)				
6. Jail	.38	.16	.11	.01	-.25	(6)			
7. Any Trt.	.17	.02	-.04	-.02	-.15	.05	(7)		
8. Mo. in Trt.	.10	-.03	-.07	.01	-.12	-.03	.77	(8)	
9. Mo. Unsup.	-.27	-.08	.01	-.01	.26	-.43	-.63	-.78	(9)
10. Composite	.77	.56	.26	.06	-.61	.59	.32	.21	-.48

($r = \pm .10$, $p < .01$)

DARP Drug Free Treatment (N=247)

1. Opioid Use	(1)								
2. Nonop. Use	.49	(2)							
3. Mari. Use	.09	.29	(3)						
4. Alcohol Use	-.02	.06	.04	(4)					
5. Employment	-.24	-.20	-.10	-.07	(5)				
6. Jail	.32	.20	.01	-.03	-.23	(6)			
7. Any Trt.	.17	.10	-.16	.07	.01	.03	(7)		
8. Mo. in Trt.	.08	.06	-.11	-.08	.01	-.04	.76	(8)	
9. Mo. Unsup.	-.25	-.19	.13	.09	.15	-.41	-.65	-.79	(9)
10. Composite	.78	.62	.20	.08	-.51	.59	.30	.16	-.47

($r = \pm .15$, $p < .01$)

DARP Detoxification (N=166)

1. Opioid Use	(1)								
2. Nonop. Use	.36	(2)							
3. Mari. Use	.21	.34	(3)						
4. Alcohol Use	.06	.32	.04	(4)					
5. Employment	-.27	-.18	-.03	.06	(5)				
6. Jail	.29	.17	.11	-.09	-.06	(6)			
7. Any Trt.	.02	.17	.06	.13	-.08	.07	(7)		
8. Mo. in Trt.	-.16	.12	-.01	-.00	-.01	-.04	.71	(8)	
9. Mo. Unsup.	.02	-.19	-.01	.08	.09	-.29	-.63	-.86	(9)
10. Composite	.75	.66	.30	.11	-.50	.52	.25	.08	-.30

($r = \pm .18$, $p < .01$)

Table B-7 (Cont.)

DARP Intake Only (N=133)									
1. Opioid Use	(1)								
2. Nonop. Use	.36	(2)				($r = \pm .20$, $p < .01$)			
3. Mari. Use	.12	.33	(3)						
4. Alcohol Use	-.06	.09	.17	(4)					
5. Employment	-.41	-.08	-.06	-.00	(5)				
6. Jail	.24	.14	-.13	-.18	-.15	(6)			
7. Any Trt.	.02	.20	-.08	.04	-.01	-.02	(7)		
8. Mo..in Trt.	-.10	.11	-.03	-.06	.03	-.17	.72	(8)	
9. Mo. Unsup.	-.02	-.17	.10	.11	.06	-.24	-.61	-.85	(9)
10. Composite	.79	.58	.13	-.01	-.56	.51	.22	.03	-.28

APPENDIX C

Analysis of Covariance

One common analytic technique used to evaluate the effects of treatment in nonexperimental research is the analysis of covariance (ANCOVA). The procedure involves measuring one or more concomitant variables (or covariates) in addition to the dependent variable; the effects of the covariates on the dependent measure are removed from the dependent variable to yield an adjusted measure which is used as the criterion in an analysis of variance. The use of ANCOVA generally involves nonequivalent control group designs (Campbell & Stanley 1963) which, in the simpliest case, consist of two groups formed by nonrandom assignment representing an experimental or treatment group and a control group. Several methodological problems in the use of ANCOVA for comparing these nonequivalent groups have been discussed by several authors (Lord 1963; Kahneman 1965; Lubin 1965; Evans & Anastasio 1968; Campbell & Erlebacher 1970; Campbell & Boruch 1975).

The assumptions for using ANCOVA include the same ones required for analysis of variance, but the proper use of ANCOVA also requires that additional assumptions be met concerning the regression procedure used to adjust the criterion measure. These specific assumptions and the implications for their violation are discussed briefly below.

For ANCOVA to be appropriate the following assumptions must be met:

1. The experimental errors (that part of a subject's score on the dependent variable which is not predictable from the grand mean, the effects of the covariates, and the effects of treatment) are independent both within each treatment level and across all treatment levels.

2. The experimental errors are normally distributed within each treatment population with a mean of 0 and equal variance.

3. The population regression weights for the covariates are the same within each group. Thus, there is no interaction between the covariates and the treatment assignment variable (additivity of effects).

ANCOVA is generally robust with respect to violation of the assumption of normality and homogeneity of the residual variance (Kirk 1968). Less is known about the effects of violating the assumption of homogeneity of the within-group regression coefficients. Winer (1971) has stated that there is evidence that ANCOVA is robust with respect to the homogeneity assumption for within-group regression weights, but Hamilton (1977) recently reported that the robustness of ANCOVA to violation of the assumption of homogeneity of regression was dependent on equal group sizes; ANCOVA appeared not to be robust for unequal group sizes.

The assumption of the independence of the experimental errors is usually considered to be met by the use of experimental controls such as randomization, but when this alternative is not available (as is often the case in field research) then the results of the analysis can be questioned on the basis of alternative explanations depending on the nature of the nonindependence of the different groups. This issue is related to the need to measure all variables which are causes of the dependent measure, and it is discussed in more detail below.

In general the criticisms of the use of ANCOVA have suggested that for ANCOVA to be appropriate the covariates must be measured without error. Authors who have advanced this opinion (Lord 1963; Kahneman 1965; Lubin 1965; Evans & Anastasio 1968; Campbell & Erlebacher 1970; Campbell & Boruch 1975) have pointed out that estimation of the relationship of the covariate "true score" to treatment assignment and the outcome measure by the use of an error-prone covariate results in a biased estimate of the effects of treatment on the outcome measure. Another important criticism of ANCOVA questions its appropriateness for use in the comparison of groups that differ significantly on the pretreatment covariates. When the groups differ on a covariate measure, the treatment assignment and the covariate are correlated; Evans and Anastasio (1968) concluded that this fact would preclude the appropriate use of ANCOVA.

These critical views on the use of ANCOVA are justified under some conditions, but there are other conditions under which ANCOVA is an appropriate technique. The critics of ANCOVA have dealt with several analytic models in which (1) the fallible covariate is affected by the treatment itself, (2) the true score on the covariate is the basis of treatment assignment, or (3) intact groups were used. In some cases they have overgeneralized their conclusions to other situations. Specifically, in the nonexperimental use of ANCOVA more consideration is warranted concerning the different reasons that may account for the correlation of the covariate with the treatment assignment variable. The case in which groups differ in mean covariate scores due to the systematic influence of the treatment (or due to inherent characteristics of intact groups) must be distinguished from the case in which group differences on the covariate are the result only of nonrandom treatment assignment based on the covariate.

Overall and Woodward (1977) and Kenny (1975) have shown that when assignment to treatment is based, either deterministically or probabilistically, on the observed covariate measured with error, then ANCOVA is appropriate and gives unbiased estimates of the treatment effects. Other support for this position has been reported by Cain (1977) and Linn and Werts (1977). The Overall and Woodward (1977) Monte Carlo studies of the bias of ANCOVA with nonrandom treatment assignment used the covariate as the only basis of treatment assignment (except for random error in the assignment process). The regression discontinuity design of Thistlethwaite and Campbell (1960) used the pretest score as the sole determinant of treatment assignment and Kenny (1975) showed that ANCOVA produces unbiased estimates of the treatment effect in this design. Further, Magidson (1977) concluded that ANCOVA would give unbiased treatment effect estimates only when assignment to treatment was based solely on the observed covariates.

The assumption made in these studies was that all the independent variables that affected the dependent variables were measured and were present in the analysis. This assumption is central to a causal interpretation of any analysis of nonequivalent groups (Duncan 1975). In the present study it was assumed that persons admitted to DARP treatment were assigned to treatment groups on the basis of their history and type of illicit drug use, age, race-ethnic classification, previous treatment, criminal behavior, and other variables that were recorded in a 94-item admission record. This screening and treatment assignment procedure is similar to those used in most drug treatment agencies, such as described by Kinsella, Africano, Rapkin, and Kleber (1974). The pretreatment information in the present study (representing the covariates in the ANCOVA) was obtained at the time of intake, before assignment to treatment, and served as the basis for treatment assignments made by the program counselors. Furthermore, these covariates can be assumed to include "measurement error" associated with the recall and self-reports of clients, but this does not invalidate the use of ANCOVA as pointed out by Overall and Woodward

(1977) and Kenny (1975). As Cain (1977) noted, the question of statistical bias in estimates of treatment effects is dependent on the investigator's knowledge of and his ability to model the treatment assignment process.

It cannot be claimed that the present study meets the stringent assumption of including all variables considered in making treatment assignments of clients, since there were subjective factors that could not be measured, which represent intuitive judgments on the part of treatment staff members.[3] The importance of including in the analysis all factors used in making assignments to treatment is that if one of the unmeasured determinants of treatment assignment affects either the measured causes of treatment assignment or the outcome measure, a spurious correlation between treatment assignment and the outcome measure would be induced. This spurious correlation would not be removed or controlled for by ANCOVA (or any other analysis) and would therefore show up as a treatment effect. Furthermore, if variables used to make treatment assignment are correlated with any omitted variables that also affect the criterion or directly affect treatment assignment, then the estimate of the treatment effect would still be biased. Thus, all the variables that are part of direct or indirect causal paths leading to treatment assignment and the outcome measure must be in the analytic equations; if omitted, the estimates of the effect of treatment on the outcome measure will be biased. The different treatment groups may differ on the covariate measures but they must be equivalent on all other dimensions or variables that affect the outcome measure. It is also noted that these same assumptions are required for alternative procedures based on structural equations (Duncan 1975; Namboodiri, Carter, & Blalock 1975). This type of error in specifying the causal model that is tested is a difficult problem which pervades almost all field research using nonexperimental designs. The solution to this problem is to build better and more comprehensive models and improved measures of the variables appropriate for testing the models.

The application of ANCOVA in the present study appears to be consistent with most of the conditions discussed above; the assumptions which may not be met involve unknown or unmeasured covariates that may have affected treatment assignments and the outcome measure. However, no analytic technique can overcome these problems. Since the extent to which these problems exist in the present data is unclear, causal interpretations based on ANCOVA or any other analysis should recognize appropriate alternative explanations.

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APPENDIX D

Multiple Regressions for the Cohort 1 and Cohort 2 Samples

Table D-1

Summary of Multiple Regression Analyses on DARP Methadone Maintenance Clients in Cohort 1

Predictor Variables	Opioid Use			Nonopioid Use			Marihuana Use			Alcohol Use			Employment		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.06	.00	.05	-.06	.00	-.07	-.06	.00	-.04	.05	.00	.03	-.05	.00	-.03
Age	-.10	.01	-.10	-.10	.01	-.10	-.30	.09*	-.30*	-.05	.00	-.13	.04	.00	-.06
Background:															
Criminality	.19	.04*	.20*	.08	.01	.07	-.10	.00	-.06	-.01	.00	.02	-.02	.00	-.01
Low SES	.01	.00	-.02	.00	.00	.00	-.19	.01	-.10	.05	.00	.10	-.04	.00	.03
Low Soc. Resp.	.14	.01	-.00	.15	.01	-.02	.04	.01	-.16*	-.04	.01	-.05	-.21	.04*	-.12
Previous Trt.:															
Chemical	.01	.00	.04	.01	.00	.01	-.11	.01	-.08	.01	.00	.02	-.00	.00	-.02
Non-Chemical	-.05	.00	-.06	.02	.00	.03	-.05	.00	-.01	.06	.01	.05	.10	.01	.06
Pre DARP Baseline:															
Nonop. Use	-.00	.00	-.06	.07	.00	.03	.22	.03*	.16*	.11	.01	.11	-.05	.00	-.00
Street Addict.	.16	.01	.09	.19	.02	.14	.06	.02*	.14	-.00	.00	-.01	-.15	.00	-.02
DARP Trt. Type:															
MM-A	.13	.01	.11	.00	.00	.03	.04	.00	.02	-.06	.01	-.08	-.06	.00	-.07
During DARP Performance:															
Social Deviance	.21	.03*	.13	.22	.03*	.17*	.07	.00	.06	-.04	.00	-.10	-.28	.04*	-.22*
Alc-Mari. Use	-.09	.00	-.03	-.05	.00	-.03	.17	.02*	.15*	.25	.05*	.25*	.15	.02	.12
Days in Trt.	-.23	.02*	-.15*	-.09	.00	-.01	.03	.00	.04	-.03	.01	-.09	.12	.00	-.02
Favorable Term.	-.14	.00	-.06	-.07	.00	-.03	.04	.00	.02	-.04	.00	-.05	.18	.01	.11
Multiple R		.39*			.30*			.44*			.33*			.37*	
% of Variance (R^2)		15.2%			8.7%			19.2%			10.6%			13.3%	
No. of Persons		379			379			379			379			379	

*$p < .01$

Table D-1 (Cont.)

Predictor Variables	Any Jail			Any Treatment			Months of Treatment			Months Unsupervised			Composite Score		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.04	.00	.03	-.29	.08*	-.28*	-.31	.10*	-.32*	.28	.08*	.29*	-.07	.00	-.09
Age	-.19	.04*	-.20*	-.10	.00	-.07	.00	.00	.03	.06	.00	.02	-.15	.02*	-.10
Background:															
Criminality	.20	.06*	.24*	.03	.00	.03	-.00	.00	-.01	-.09	.01	-.09	.20	.05*	.20*
Low SES	.10	.02*	.09	-.02	.01	.06	.04	.01	.10	-.06	.02*	-.11	.00	.00	-.02
Low Soc. Resp.	.28	.03*	.14	.08	.00	.07	.04	.00	.09	-.15	.02*	-.19*	.27	.04*	.10
Previous Trt.:															
Chemical	-.00	.00	.00	.08	.00	.05	.09	.00	.04	-.08	.00	-.04	.03	.00	.04
Non-Chemical	-.01	.00	-.01	-.00	.00	-.03	-.01	.00	-.04	.00	.00	.04	-.05	.01	-.06
Pre DARP Baseline:															
Nonop. Use	.04	.00	.00	-.04	.00	-.04	-.08	.00	-.06	.10	.01	.10	.06	.00	-.01
Street Addict.	.22	.01	.10	-.03	.00	-.05	-.06	.00	-.07	-.02	.00	.05	.24	.02*	.12
DARP Trt. Type:															
MM-A	.05	.00	.02	-.01	.00	.01	-.03	.00	.01	.02	.00	.00	.10	.01	.10
During DARP Performance:															
Social Deviance	.14	.00	-.02	.03	.00	.04	-.02	.00	.01	-.02	.00	.02	.29	.04*	.16*
Alc-Mari. Use	-.08	.00	-.01	-.05	.00	-.01	-.06	.00	-.03	.08	.00	.01	-.11	.00	-.04
Days in Trt.	-.11	.00	-.01	.09	.01	.10	.13	.01	.13	-.06	.00	-.08	-.19	.01	-.06
Favorable Term.	-.18	.02*	-.17*	.01	.00	-.03	.02	.00	-.02	.04	.00	.07	-.20	.02*	-.14*
Multiple R		.43			.33			.37*			.38*			.47*	
% of Variance (R^2)		18.6%			11.1%			13.8%			14.8%			22.2%	
No. of Persons		400			400			400			400			379	

*p<.01

Table D-2

Summary of Multiple Regression Analyses on DARP Therapeutic Community Clients in Cohort 1

Predictor Variables	Opioid Use			Nonopioid Use			Marihuana Use			Alcohol Use			Employment		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.06	.00	.08	-.13	.02	-.13	-.03	.00	.03	.01	.00	.01	-.07	.00	-.01
Age	.07	.00	-.03	-.01	.00	.03	-.16	.03	-.09	.10	.01	.13	.03	.00	-.06
Background:															
Criminality	.06	.00	.04	-.01	.00	.06	.03	.00	.06	.02	.00	.04	-.10	.01	-.12
Low SES	.05	.00	-.03	.05	.01	.10	-.06	.00	-.04	-.05	.01	-.07	-.07	.00	-.02
Low Soc. Resp.	.01	.00	.01	.06	.00	.04	.16	.01	.11	-.13	.00	-.03	-.18	.03*	-.17
Previous Trt.:															
Chemical	.11	.01	.09	.03	.00	.01	.02	.00	.05	-.01	.00	-.02	.16	.03*	.20*
Non-Chemical	.01	.00	.05	-.08	.01	-.07	-.09	.01	-.06	.03	.00	.02	.15	.02	.13
Pre DARP Baseline:															
Nonop. Use	-.11	.01	-.11	.26	.06*	.26*	.17	.02	.09	.06	.01	.08	-.10	.01	-.11
Street Addict.	.11	.01	.09	-.01	.00	-.02	.02	.00	-.02	-.08	.00	-.05	-.15	.01	-.10
DARP Trt. Type:															
TC-T	-.07	.01	-.05	-.12	.00	-.04	-.17	.02	-.15	.06	.01	.10	.07	.00	-.02
During DARP Performance:															
Social Deviance	.14	.01	.04	.05	.00	.01	-.08	.01	-.09	-.06	.00	-.07	-.09	.01	-.06
Alc-Mari. Use	.02	.00	.05	.01	.00	-.03	.11	.00	.07	.08	.01	.09	.01	.00	-.02
Days in Trt.	-.37	.13*	-.29*	-.30	.07*	-.24*	-.04	.00	-.07	-.03	.00	-.08	.30	.09*	.22*
Favorable Term.	-.33	.02	-.17	-.20	.00	-.07	-.02	.00	.00	.01	.00	.04	.31	.02*	.18*
Multiple R		.46*			.43*			.31			.23			.50*	
% of Variance (R^2)		21.2%			18.8%			9.8%			5.2%			24.6%	
No. of Persons		247			247			247			247			247	

*p<.01

Table D-2 (Cont.)

Predictor Variables	Any Jail			Any Treatment			Months of Treatment			Months Unsupervised			Composite Score		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.12	.01	.06	-.05	.00	-.03	-.06	.00	-.05	-.03	.00	.03	.03	.00	.01
Age	.03	.00	-.14	.14	.02	.10	.17	.04*	.11	-.14	.02	.04	.08	.01	-.01
Background:															
Criminality	.16	.02	.16*	.02	.00	.01	.08	.01	.06	-.28	.07*	-.29*	.08	.00	.09
Low SES	.17	.02	.14	-.14	.02	-.17	-.11	.02	-.12	-.09	.00	-.08	.08	.00	.04
Low Soc. Resp.	-.05	.02	-.14	-.14	.00	-.09	-.15	.00	-.11	.12	.01	.17	-.00	.00	-.03
Previous Trt.:															
Chemical	-.06	.00	-.08	.07	.00	.04	.10	.00	.06	-.04	.00	.00	.03	.00	-.01
Non-Chemical	.01	.00	.04	-.05	.01	-.05	.01	.00	-.01	-.02	.00	-.02	-.07	.01	-.03
Pre DARP Baseline:															
Nonop. Use	-.12	.00	-.05	.06	.00	.05	.08	.01	.08	.04	.00	-.01	.04	.00	.06
Street Addict.	-.02	.00	.02	.10	.01	.14	.11	.01	.13	-.05	.00	-.06	.11	.01	.12
DARP Trt. Type:															
TC-T	.10	.00	.10	-.13	.01	-.06	-.15	.01	-.08	.04	.00	.01	-.10	.01	-.02
During DARP Performance:															
Social Deviance	.08	.01	.04	.10	.00	.03	.12	.01	.04	-.09	.00	.00	.14	.01	.04
Alc-Mari. Use	.08	.01	.10	.07	.00	.07	.09	.00	.08	-.08	.00	-.09	.08	.00	.09
Days in Trt.	-.27	.08*	-.22*	-.20	.04*	-.14	-.16	.02	-.11	.34	.11*	.29*	-.45	.20*	-.32*
Favorable Term.	-.27	.01	-.13	-.18	.01	-.11	-.13	.00	-.07	.27	.01	.10	-.45	.05*	-.27*
Multiple R		.43*			.37*			.36*			.49*			.55*	
% of Variance (R^2)		18.7%			13.8%			13.3%			24.1%			30.7%	
No. of Persons		264			264			264			264			247	

*p<.01

Table D-3

Summary of Multiple Regression Analyses on
DARP Methadone Maintenance Clients in Cohort 2

Predictor Variables	Opioid Use			Nonopioid Use			Marihuana Use			Alcohol Use			Employment		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.04	.00	.08	.01	.00	.04	-.03	.00	-.02	.05	.00	.01	-.07	.01	-.05
Age	-.12	.01	-.06	-.06	.00	-.04	-.20	.04*	-.27*	.12	.01	.05	-.02	.00	-.07
Background:															
Criminality	.06	.00	.05	.17	.03*	.15	.08	.01	.06	.13	.01	.13	-.12	.02	-.08
Low SES	-.04	.00	-.07	.05	.00	.06	-.02	.00	.04	.08	.00	.08	-.18	.03*	-.13
Low Soc. Resp.	.12	.01	.02	.04	.00	-.03	.01	.01	-.16	-.10	.01	-.03	-.20	.04*	-.13
Previous Trt.:															
Chemical	.01	.00	.04	.04	.00	.07	-.03	.00	-.00	-.09	.01	-.07	.01	.00	.00
Non-Chemical	-.00	.00	.03	.03	.00	.03	.08	.00	.07	-.01	.00	-.00	-.03	.00	-.04
Pre DARP Baseline:															
Nonop. Use	-.06	.01	-.13	.07	.00	.02	.11	.01	.08	.02	.00	.03	-.06	.00	-.00
Street Addict.	.14	.01	.10	.07	.00	-.01	.12	.02	.16	-.01	.00	-.02	-.19	.00	-.01
DARP Trt. Type:															
MM-A	.02	.00	-.03	.14	.01	.08	.06	.00	-.01	-.10	.01	-.11	.01	.00	.00
During DARP Performance:															
Social Deviance	.22	.03*	.13	.28	.06*	.21*	.05	.00	-.01	.01	.00	-.03	-.31	.07*	-.27*
Alc-Mari. Use	.00	.00	.05	.07	.00	.10	.12	.01	.12	.24	.04*	.24*	.04	.00	.01
Days in Trt.	-.25	.04*	-.21*	-.21	.02	-.16	-.01	.00	-.00	-.08	.02	-.17	.10	.00	.02
Favorable Term.	-.10	.00	-.02	-.06	.00	.00	.02	.00	-.00	-.02	.00	.02	.10	.00	.04
Multiple R		.35*			.38*			.33*			.35*			.40*	
% of Variance (R^2)		12.4%			14.8%			10.7%			12.1%			15.8%	
No. of Persons		274			274			274			274			274	

*p<.01

Table D-3 (Cont.)

Predictor Variables	Any Jail r	Any Jail ΔR^2	Any Jail β	Any Treatment r	Any Treatment ΔR^2	Any Treatment β	Months of Treatment r	Months of Treatment ΔR^2	Months of Treatment β	Months Unsupervised r	Months Unsupervised ΔR^2	Months Unsupervised β	Composite Score r	Composite Score ΔR^2	Composite Score β
Demographic:															
Black	.02	.00	.07	-.23	.05*	-.17*	-.25	.06*	-.19*	.24	.06*	.15	-.00	.00	.05
Age	-.10	.01	-.15	.09	.01	.07	.06	.01	.03	-.02	.00	.03	-.11	.01	-.09
Background:															
Criminality	.20	.05*	.22*	.12	.01	.10	.10	.00	.08	-.18	.02*	-.17*	.21	.05*	.20*
Low SES	.04	.00	.07	.01	.00	.06	-.04	.00	.04	.02	.00	-.06	.08	.01	.09
Low Soc. Resp.	.05	.00	-.01	.01	.00	.07	-.03	.00	.01	-.01	.00	.00	.15	.01	.07
Previous Trt.:															
Chemical	.08	.01	.09	.28	.05*	.21*	.24	.03*	.16*	-.30	.06*	-.23*	.10	.01	.13
Non-Chemical	.00	.00	-.01	.09	.00	.04	.10	.00	.04	-.09	.00	-.03	.04	.00	.04
Pre DARP Baseline:															
Noncp. Use	-.04	.00	-.06	-.03	.00	.01	.02	.00	.07	.00	.00	-.03	.01	.00	-.05
Street Addict.	.04	.00	-.03	-.07	.01	-.13	-.12	.01	-.15	.06	.01	.12	.12	.00	-.02
DARP Trt. Type:															
MM-A	.03	.00	-.02	-.09	.01	-.09	-.07	.01	-.08	.06	.01	.09	.03	.00	-.04
During DARP Performance:															
Social Deviance	.17	.02	.12	.03	.00	.07	-.03	.00	.04	-.10	.01	-.14	.33	.08*	.24*
Alc-Mari. Use	.09	.01	.11	-.04	.00	-.05	-.08	.01	-.12	.05	.00	.09	.06	.01	.11
Days in Trt.	-.08	.00	-.05	.09	.00	.04	.13	.01	.10	-.10	.01	-.11	-.22	.03*	-.18*
Favorable Term.	-.09	.00	-.05	.03	.00	.05	.05	.00	.04	.00	.00	-.01	-.10	.00	-.02
Multiple R		.33*			.38*			.39*			.42*			.45*	
% of Variance (R^2)		11.1%			14.6%			14.8%			18.1%			20.5%	
No. of Persons		282			282			282			282			274	

*p<.01

Table D-4

Summary of Multiple Regression Analyses on
DARP Therapeutic Community Clients in Cohort 2

Predictor Variables	Opioid Use			Nonopioid Use			Marihuana Use			Alcohol Use			Employment		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	.12	.01	.11	.03	.00	.07	.03	.00	.07	-.01	.00	.01	-.15	.02	-.11
Age	-.02	.00	-.05	.03	.00	.05	-.16	.03	-.00	.07	.00	.09	.06	.01	.00
Background:															
Criminality	-.00	.00	-.02	.04	.00	.04	-.15	.01	-.11	.02	.00	.05	-.00	.00	.02
Low SES	.03	.00	-.02	.05	.00	.01	-.14	.01	-.14	-.05	.00	-.04	-.15	.02	-.09
Low Soc. Resp.	.10	.01	.05	.05	.00	.08	.22	.04*	.21*	-.14	.01	-.05	-.27	.06*	-.23*
Previous Trt.:															
Chemical	.05	.01	.07	.10	.01	.09	-.06	.00	-.00	-.05	.00	-.05	.01	.00	-.00
Non-Chemical	-.03	.00	.04	.01	.00	.02	-.15	.02	-.13	.10	.01	.09	.02	.00	-.04
Pre DARP Baseline:															
Nonop. Use	-.03	.00	-.01	.22	.06*	.23*	.12	.02	.12	.09	.01	.07	-.03	.00	-.06
Street Addict.	.17	.02	.16	.01	.00	.00	.01	.00	.02	-.18	.02	-.16	-.19	.01	-.13
DARP Trt. Type:															
TC-T	-.11	.02	-.07	-.13	.01	-.09	.00	.00	.02	-.01	.00	.01	.04	.01	.06
During DARP Performance:															
Social Deviance	.17	.02	.13	-.01	.00	-.05	.06	.00	.05	-.09	.01	-.09	-.06	.00	-.01
Alc-Mari. Use	-.02	.00	.03	.09	.00	.04	.09	.01	.10	.05	.00	.00	.06	.00	.02
Days in Trt.	-.38	.12*	-.35*	-.27	.07*	-.24*	-.16	.02	-.14	.01	.00	-.03	.38	.12*	.35*
Favorable Term.	-.18	.00	-.02	-.18	.00	-.08	-.09	.00	.01	.03	.00	.03	.21	.00	.04
Multiple R		.46*			.40*			.39*			.27			.51*	
% of Variance (R^2)		21.5%			16.3%			15.4%			7.3%			26.3%	
No. of Persons		227			227			227			227			227	

*p<.01

Table D-4 (Cont.)

Predictor Variables	Any Jail			Any Treatment			Months of Treatment			Months Unsupervised			Composite Score		
	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β	r	ΔR^2	β
Demographic:															
Black	-.00	.00	-.04	-.06	.00	-.05	.05	.00	.05	-.06	.00	-.02	.06	.00	.05
Age	-.02	.00	-.00	.08	.01	.05	.12	.01	.10	-.09	.01	-.08	-.01	.00	.02
Background:															
Criminality	.16	.03*	.13	.08	.00	.06	.05	.00	.01	-.13	.01	-.07	.07	.01	.05
Low SES	.00	.00	-.04	.01	.00	-.03	.05	.00	-.00	-.05	.00	.02	.05	.00	-.02
Low Soc. Resp.	.14	.02	.06	-.00	.00	.01	-.01	.00	.04	-.05	.01	-.03	.17	.03*	.15
Previous Trt.:															
Chemical	.03	.00	.02	.09	.00	.04	.12	.01	.09	-.09	.00	-.05	.08	.01	.07
Non-Chemical	.10	.01	.12	.00	.00	-.00	.04	.00	.04	-.07	.00	-.08	-.01	.00	.05
Pre DARP Baseline:															
Nonop. Use	.01	.00	-.01	.02	.00	-.01	.01	.00	.02	.01	.00	-.01	.10	.01	.10
Street Addict.	.24	.03	.19*	.09	.00	.09	.08	.00	.05	-.21	.02	-.18	.19	.02	.16
DARP Trt. Type:															
TC-T	-.01	.00	.04	-.17	.03	-.13	-.11	.01	-.10	.05	.00	.04	-.15	.03*	-.09
During DARP Performance:															
Social Deviance	.16	.02*	.15	.03	.00	-.00	-.04	.00	-.06	-.05	.00	-.01	.16	.02	.10
Alc-Mari. Use	.01	.00	.08	.11	.00	.08	.04	.00	.01	.03	.00	-.00	.03	.00	.06
Days in Trt.	-.30	.10*	-.29*	-.10	.01	-.12	-.09	.01	-.10	.24	.06*	.21*	-.51	.24*	-.50*
Favorable Term.	-.18	.00	-.07	-.02	.00	-.00	-.01	.00	.01	.17	.01	.11	-.24	.00	-.02
Multiple R		.46*			.26			.23			.37*			.60*	
% of Variance (R^2)		21.0%			6.7%			5.3%			13.9%			36.6%	
No. of Persons		246			246			246			246			227	

*p<.01

ENDNOTES

[1]Data reported here concerning Pre DARP treatment are based on Admission Records and are slightly different from similar data obtained in the followup interview.

[2]The assumption of homogeneity of the within-group regression coefficients was met for the analyses involving Opioid Use, Employment, and Any Jail. Although this assumption was violated ($p<.05$) in the analyses of the remaining criteria, the effects of such a violation are uncertain (see appendix C).

[3]Although there may be some omitted variables which were systematically used in making treatment assignments, it should be noted that these subjective judgments may be considered part of a probabilistic or error prone treatment assignment procedure for which Overall and Woodward (1977) have shown that ANCOVA yields unbiased estimates of the effect of treatment.

END

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