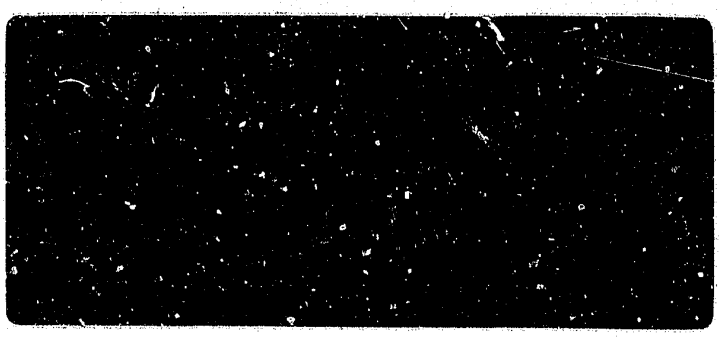

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The Comparative Effectiveness of Methadone Maintenance, Therapeutic Community, Outpatient Drug-Free, and Outpatient Detoxification Treatments for Drug Users in the DARP. Cohort 1-2 Followup Study.

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The Comparative Effectiveness of Methadone Maintenance, Therapeutic Community, Outpatient Drug-Free, and Outpatient Detoxification Treatments for Drug Users in the DARP. Cohort 1-2 Followup Study.

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Chapter 1

INTRODUCTION

This monograph reports a study of the comparative effectiveness of four treatment modalities (methadone maintenance - MM, therapeutic community - TC, outpatient drug-free - DF, and outpatient detoxification - DT), and is one of a series of related investigations based on the data for the DARP Cohort 1 - Cohort 2 followup samples. The followup studies are in turn part of a research program on the evaluation of treatment built on the data base of c.44,000 patients at 52 treatment agencies developed by means of the Drug Abuse Reporting Program (DARP) between 1969 and 1974 (Sells, 1974 a, b; Sells and Simpson, 1976 a, b, c; Sells, Demaree, Simpson, Joe and Gorsuch, 1977). Other studies in the present series are cited in context in the body of this report.

A distinctive feature of the study presented here involves the use of post DARP outcome groups which serve as behavior-based criterion composites. The outcome groups are identified by profiles of scores on six variables (E - employment, O - opioid use, N - nonopioid use, A - alcohol use, C - criminality, T - reentry to treatment). Different profiles represent different outcome patterns and these have a possible range from the most favorable profile (e.g., positive outcomes as defined on employment, opioid use, nonopioid use, criminality, and return to treatment; alcohol use was not counted for reasons explained later), through all combinations of favorable and unfavorable indications on these variables, to the most unfavorable profile (e.g., negative outcomes on all variables except alcohol use). Thus, by classifying individuals in each treatment sample into groups according to outcome profiles and then

ordering the profiles on a scale of favorableness of outcome, it is possible, with some assumptions that can be specified, to assess the effectiveness of the treatments included in the study.

The assumptions involved are simple to state but difficult to meet. First, a generalized index of effectiveness for a treatment group requires specification of the treatment and demonstration that the sample used to estimate it is representative of the population universe for the treatment. Representativeness for the treatment as well as the sample should also take into account relevant environmental, contextual factors that may vary over time; similar treatments and patient samples observed at different time periods may vary as a result of different contextual influences. The DARP population was not designed to be representative of the universe of drug users in the United States, of the universe of drug users in treatment, or even the universe of drug users in federally-sponsored treatment. Nevertheless, the DARP treatment sample is a large and extensively researched data base and cogent statements can be made concerning the representativeness of the followup samples to the total DARP treatment samples. Treatment descriptions for the modalities included have already been published (Cole and Watterson, 1974; James, Watterson, Bruni, and Cole, 1976) and contextual factors have been investigated (Joe, Singh, Finklea, Hudiburg, and Sells, 1977). It is believed that useful indices of effectiveness can be computed and that limited generalization may be warranted.

Another assumption, that relates mainly to comparisons of indices for different treatments, is that the population samples and relevant temporal and contextual factors should be comparable. In the present research, the population samples were not comparable and this presented some challenging problems.

Some account can be taken of the known differences, by statistical means. For example, Simpson, Savage, Lloyd, and Sells (1977) adjusted post DARP scores

on a number of criteria for pre DARP population background and baseline differences between treatment groups by analysis of covariance. A similar procedure has been used in the present study. In addition, some of the analyses presented here involved the partitioning of samples according to critical control variables. Although the DARP data are organized by a cohort design, it is probably accurate to acknowledge that the temporal and contextual factors alluded to above have been only imperfectly controlled. Comparative statements concerning the effectiveness of the DARP treatments must therefore be qualified. However, the grand design of the DARP program involves the replication of the present study on a later cohort (Cohort 3) for which data collection is currently in progress. Studies of the three cohorts are planned and are expected to illuminate many issues that cannot presently be addressed.

A third important assumption relates to the relevance of the criteria in relation to each of the treatments and treatment samples to be compared. With regard to the treatments, our general impression is that only employment and criminality, and perhaps alcohol use, are viewed similarly by all publicly supported treatment programs; that is, they tend to regard employment and avoidance of criminality as conforming, and to be tolerant of alcohol use even when officially disapproving. On the other hand, drug use, at any level, is rejected by TCs which almost universally demand total abstinence from illicit drugs, while many MM programs have shown tolerance for light or occasional opioid and nonopioid use and indifference to marihuana use, as long as patients continued on their maintenance regimes and no indications of criminality were seen. There is some indication that some DF programs have been cavalier about light nonopioid use as well as marihuana use and were more concerned about

conformity in relation to work, school attendance (as an alternative to work, for youth), and elimination of illegal-criminal activities. In relation to reentry to treatment, there is again a difference between MM programs, many of which advocate indefinite maintenance, at least for addicts who are unable to detoxify (see Sells, 1978), and the drug-free treatments, particularly TC, which appear to regard return to treatment as a form of recidivism.

With regard to the treatment samples, the implications are clear for variations on pre DARP levels of several criteria. The principle involved is that the more deviant the patient on any dimension (e.g., opioid use) at or prior to admission, the greater the relevance of that dimension in the evaluation of his or her treatment outcomes; and conversely, the less deviant, the less important the respective dimension. Differences among the Cohort 1-2 treatment samples are shown in Table 1. In addition to the four treatment modalities, this table includes a comparison no-treatment group labeled IO to signify that they went through Intake Only and did not return to DARP treatment. As discussed by Simpson and Joe (1977) the IO group is not in any sense a control group, but is nevertheless of interest for comparative purposes. Table 1 is limited to Black and White males who represent the only major subset of the followup sample that was represented in all five treatment followup samples. In addition to the criterion levels, Table 1 also shows mean age, percent Black, and percent in each of three drug use categories, which have implications for the interpretation of the data.

The characteristics of the treatment samples were subject to constraints in the sampling plan (Simpson and Joe, 1977). A glance at Table 1 shows, first, that although there were differences among the five groups, there is substantial overlap as well. The MM group was the oldest and the DF group the youngest,

Table 1. Comparison of Age, Race, and Pre DARP Levels of Five Treatment Groups on Nine Criterion Measures. Sample -- 2198 Black and White Males, Cohorts 1 and 2 Combined. (Based on Simpson, Savage, Lloyd, and Sells, 1977.)

Comparison Variable	DARP Treatment Group				
	MM	TC	DF	DT	TO
Mean Age	27	24	23	26	24
Percent Black	53%	47%	45%	50%	51%
Percent Daily Opioid Users[1]	84%	61%	48%	80%	70%
Percent Not Daily Opioid Users[2]	16%	39%	52%	20%	30%
Percent Using Nonopioids Only[2]	3%	11%	25%	7%	9%
Mean Opioid Use[3]	3.69	3.26	2.64	3.63	3.44
Mean Nonopioid Use[3]	1.91	2.23	2.13	2.04	2.04
Mean Marijuana Use[3]	1.77	2.16	2.33	1.89	2.12
Mean Alcohol Use[4]	1.34	1.37	1.43	1.37	1.25
Percent Employed - 2 mos. pre DARP	46%	34%	40%	46%	37%
Months Employed - 12 mos. pre DARP	4.8	3.8	4.2	4.9	3.8
Percent Arrested per year -- lifetime pre DARP	21%	24%	15%	17%	19%
Percent with Jail Time -- lifetime pre DARP	75%	79%	63%	59%	70%
Percent with Prior Drug Treatment -- lifetime pre DARP	54%	56%	40%	45%	53%
Number of Black and White Males in Followup Sample	921	735	289	174	159

[1]Includes users of daily opioids only and daily opioids plus other drugs during the 2-month period preceding DARP admission.
[2]Based on the 2-month period preceding DARP admission.
[3]Scored for the 2-month period preceding DARP admission: 1 - Never; 2 - Less than weekly; 3 - Weekly; 4 - Daily.
[4]Scored for the 2-month period preceding DARP admission: 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.

but within the range of perhaps 19 to 30, there were substantial numbers in every group. DF had the fewest Blacks (and most Whites), but even DF was 45% Black. Similarly although the percentages of active addicts (daily opioid users) at admission varied widely (from 48% in DF to 84% in MM), it must be recognized that at the very least roughly half of every treatment group was composed of addicts. On the other hand, only DF had as many as one-fourth of its number identified as nonopioid users only.

Despite the overlap, a number of characteristic differences could be discerned among these treatment samples that have implications for the analytic approach and emphasis on various criteria. These are as follows:

MM. The MM group was composed almost entirely of opioid addicts. Presumably the 16% who were reported as other than daily opioid users in the baseline period were transferred to treatment from other treatment programs, hospitals, jails, or other institutions and were eligible for methadone maintenance. As a group, the MM patients were high on pre DARP opioid use, comparatively low on nonopioid use, and comparatively high on employment, criminality, and prior treatment. At the same time they were the oldest group and had the highest percentage of Blacks.

Considering the implications of the idiosyncratic treatment and treatment sample characteristics noted above, it appears that opioid use is a critically important criterion for MM and nonopioid use of minor importance, thus reflecting the predominantly addict composition of the MM group. In addition, the high pre DARP level on criminality gives emphasis to this variable. The status of return to treatment as a post DARP criterion presents a problem in the evaluation of MM; Simpson and Savage (1978) have shown that in all treatment groups, those

who remained out of treatment for the first three years after leaving DARP tended to have superior scores on the remaining criteria to those who reentered treatment during that period. At the same time, recent evidence showing that substantial numbers of long-term heroin addicts were unable to detoxify (Cushman, 1974; Dole and Joseph, 1977; Senay, E.C., Dorus, W., Goldberg, F., & Thornton, W., 1977; Stimmel, B., Goldberg, J., Rotkopf, E., & Cohen, M., 1977) lends some weight to the arguments of Dole and others (see Dole and Joseph, 1978) that indefinite maintenance (and by implication, reentry into treatment) is a preferred strategy, at least for such individuals. However, in view of the Vietnam veterans study by Robins (Robins, 1973, 1975; Robins, Davis, and Nurco, 1974) and some of the results in the present study, the issue cannot be considered as resolved. Although the current DARP followup research has shown empirically that return to treatment is an unfavorable outcome (Simpson and Savage, 1978) and it is formally scored in that direction, it is recognized that this may be considered unfair to MM by some readers (e.g., Dole) and this is taken into account in the weighing of evidence and in the discussion and conclusions.

TC. Whereas the MM group appeared to be composed almost entirely of addicts, addicts comprised only 61% of the TC group, the remainder, characterized here as nonaddicts included 11% who were users of nonopioids only and 28% who used opioids less than daily along with various nonopioids. Related to this, it appears that opioid use is an important criterion for the addict portion of the TC sample. Both opioid and nonopioid use are relevant for polydrug users, and nonopioid use only, for the remainder. However, because of sample size, it appeared necessary to combine the two nonaddict groups for purposes of analysis. Thus, while evaluation of the total TC sample is justified for comparative purposes, separate analysis of the addict and other (remainder) subsamples also appeared to be indicated. On the issue of return to treatment,

in contrast to MM, for both TC subsamples, return to treatment is properly regarded as a negative outcome. Finally, despite the fact that the TC sample included a substantial proportion of "other" (not daily opioid users) patients, more White, and was younger on the average than the MM sample, it is noteworthy that TC had a slightly higher level of criminality than MM.

DF. With the exception of criminality and employment, which are age related, the DF population is generally most dissimilar to MM, while the TC group lies in between. Thus in Table 1 it is seen that the percentages of daily opioid users in MM, TC, and DF were 84, 61, and 48, respectively, and of nonopioid users, 3, 11, and 25, respectively. Differences between these groups can also be seen for age, percent Black, pre DARP means on opioid and nonopioid use, and the percentage with pre DARP treatment. There is a tendency and some justification (see Sells and Simpson, 1977) to regard DF treatments as focused primarily on nonopioid users; however, DF appears to be composed of addicts (48%), nonopioid users (25%), and polydrug users - other nondaily opioid and nonopioid users (27%) and as in the case of TC, this represents at least two discrete groups, addicts and others, that should be analyzed separately. In the case of addicts, opioid use is the important drug use criterion and for others, it is nonopioid use. Here again return to treatment is believed properly to represent a negative outcome.

DT. The DT sample is composed almost entirely of opioid addicts and is shown in Table 1 to resemble the MM sample very closely. Apparently most DARP Cohort 1-2 patients in detoxification treatment were treated for opioid drugs. The same criteria are believed to be generally appropriate for DT as for MM. In the case of return to treatment, however, a different question should be raised. That is, since DT is a very short-term treatment and is often considered as a channel for recruitment of patients to more extensive and definitive treatment, it would seem questionable to regard return to treatment as a negative outcome for DT.

IO. The IO sample, as summarized in Table 1, was composed primarily of daily opioid users (70%) and had approximately as many polydrug users as DF (21%) but few nonopioid users (9%). It appears desirable to consider the addict and other subsamples separately, as in the case of TC and DF.

Summary Comment. As discussed elsewhere by Sells, Demaree, Simpson, Joe, and Gorsuch (1977), the same criteria were considered applicable to all treatments, but with different emphasis. The pre DARP means on alcohol use showed little variation between treatment groups and in addition alcohol use was contraindicated for inclusion in the outcome groups on the basis of consistency with the other outcomes (Hornick, Demaree, Sells, and Neman, 1977). Nevertheless, alcohol use was associated with nonopioid use in the nonaddict subsamples and was retained as an outcome measure in the analyses. Among all the outcome measures, alcohol use showed the least covariation, but was associated with nonopioid use. Although alcohol use received a low weight in defining the composite score and did not play a deciding role in the formation of the outcome groups, it did differ significantly over the outcome groups and was retained in the analyses.

Chapter 2

DERIVATION AND DESCRIPTION OF THE COMPOSITE OUTCOME MEASURES

For the purpose of estimation of effectiveness rates for treatments it was recognized that composite measures, which might give overall indications of favorableness of outcome, as opposed to multiple indications on discrete criteria, were strategically desirable. Further, in order to have information that required a minimum of explanation, that would retain comparability over time, across diverse treatment settings and population subgroups, it was decided to employ behaviorally based measures. The development of the EONACT profile, with post DARP scores for employment, opioid use, nonopioid use, alcohol use, criminality, and return to treatment, and the derivation of the composite score and outcome groups, based on this profile, is described in detail by Hornick et al. (1977).

Outcome profiles. The six outcome scores comprising the EONACT profile are described with their behavioral anchors in Table 2. These were computed separately for each patient in the total Cohort 1-2 followup sample for each year after leaving DARP treatment and the calculations were adjusted to reflect time at risk (not institutionalized) in each year. In addition, a 3-year profile was computed, averaging the scores for each year.

The categorical scores shown in Table 2 not only reflected specific behavioral definitions and equivalent scale values, but were highly correlated with the quantitative index scores developed for the respective variables. These correlations were .97 in each year for employment, .95 in each year for opioid use, .91 in each year for nonopioid use, .82 in each year for alcohol consumption, and .85 in each year for criminality with time in jail. The correlations of criminality with number of arrests were .72 in post DARP year 1, .64 in year 2, and .59 in year 3.

Table 2. Summary of Scale Equivalent Behavioral Anchors for Each of the Six Outcome Elements of the EONACT Profile. (From Hornick, Demaree, Sells, and Neman, 1977.)

Outcome Element	
E = Employment	0 employed >67% of time at risk 1 employed 1-67% of time at risk 2 employed 0% of time at risk
O = Opioid Use	0 no use over time at risk 1 mean use ranging from less than weekly through 4 days/week 2 mean use ≥5 days/week
N = Nonopioid Use	0 no use over time at risk 1 mean use ranging from less than weekly through 4 days/week 2 mean use ≥5 days/week
A = Alcohol Consumption	0 mean daily intake ≤8 ounces of 80-proof equivalent 1 mean daily intake >8 ounces of 80-proof equivalent
C = Criminality	0 no arrests and no days jailed 1 not more than one arrest and not more than 30 days jailed 2 more than one arrest or more than 30 days jailed
T = Treatment	0 no return to treatment during the year or during subsequent years since DARP 1 return to treatment during the year or during subsequent years since DARP

Composite scores. Intercorrelations of the six profile scores (separately for each year and for the 3-year average) were analyzed by the method of principal components and composite outcome scores were computed using the loadings on the first principal component as a basis for integer weights. The weights assigned were:

opioid use 5

nonopioid use 5

treatment 5

criminality 4

employment 3

alcohol use 1

and the correlations between scores based on these weights precisely computed and scores on the first principal component were between .997 and .998 for each year post DARP.

In the present study the composite score has been used primarily as an index of favorableness of outcome to order the outcome group profiles, discussed next, on this dimension. Simpson et al. (1977) included the composite score for post DARP year 1 as a major dependent variable in a regression study of the same Cohort 1-2 sample. However, for the present purposes, it was felt that qualitative differences revealed by varying profiles would be as important as quantitative differences in level of performance revealed by the outcome score and major interest was directed toward the development of a set of discrete outcome groups.

Outcome groups. Eleven discrete profiles of the EONACT variables, reflecting discrete outcome patterns, were derived by Hornick et al. (1977) by a series of hierarchical cluster analyses of the same data as used to

compute composite scores. In these analyses alcohol use did not appear in any of the algorithms employed to assign patients to outcome groups. However, alcohol use scores were computed for every group in every period for comparative purposes.

The Hornick et al. report describes the development of the outcome groups, the defining characteristics of the groups, their homogeneity, distinctiveness, relative size, and stability over three years for which post DARP profile scores were available. The 11 groups are described in Table 3, which includes average profiles, group descriptions, average composite scores, and percentages indicating relative group size in the total followup sample. The groups are listed in this table in order of mean composite score rather than in the order of assignment, as described by Hornick et al. (1977).

Since the average three-year profile element scores were rounded to the nearest integer in the computation of the three-year profiles (see Hornick et al., 1977), they do not reflect moderate deviations above zero in any one year for those individuals who had zero scores in any two years. For example, if an individual received scores on Opioid Use (0) of 0, 1, and 0 in years 1, 2, and 3, his profile mean for element 0 would have been zero (that is .33 rounded to zero). As a result, some minor discrepancies may appear in the profile descriptions of some of the groups, such as zero drug use in outcome group 2 in which 100% of the patients returned to treatment within the first three years after DARP. Such apparent discrepancies should be understood as consequences of the method of profile calculation; they do not reflect errors in the profiles and had no significant effects on the interpretation of the results.

Although the groups at each extreme on the scale, 1-3-2 (favorable), and 11-10-7 (unfavorable, Table 3) were each defined by very similar profiles and were, therefore, quite homogeneous with respect to outcomes, this was not true of all the groups. For example, group 8 included profiles as dissimilar as

Table 3. Description of Post DARP Outcome Groups with Mean Composite Scores and Percentages of Total Sample in Each Group (N=2938). Based on Hornick, Demaree, Sells, and Neman (1977).*

Group Number	Mean Composite Score	Percentage in Group	Profile Description	Mean 3-Year Profile					
				E	O	N	A	C	T
1.	2.3	15.0	Drug abstinence and Favorable overall	0	0	0	.1	0	0
3.	13.5	11.3	Drug abstinence and generally Favorable, with high Unemployment.	1.4	0	0	.2	.1	0
2.	14.5	5.4	Drug abstinence and generally Favorable exc. 100% T	0	0	0	.1	0	1.0
8.	27.5	9.5	Opioid abstinence with mod.-high Nonopioid	.8	0	1.1	.3	.3	.4
4.	29.0	12.2	Not heavy Opioid and no Nonop. use, no C, and 100% T	1.2	.5	0	.2	0	1.0
5.	35.8	9.5	Not heavy Opioid and no Nonop. use, mod.-high Criminality	1.0	.6	0	.2	1.3	.6
6.	36.3	8.0	Mod.-heavy Opioid and no Nonop. use, Not high Criminality	1.1	1.6	0	.2	.3	.4
9.	42.0	14.0	Mod. on Drug Use and Criminality	.9	1.0	1.0	.3	.4	.6
11.	57.5	5.8	Mod.-heavy Drug Use and not high Criminality	1.2	1.7	1.5	.3	.3	.6
10.	62.3	4.2	Mod.-heavy Opioid use and high Criminality	1.4	1.5	1.0	.3	2.0	.2
7.	72.8	5.3	Heavy Opioid use, high Criminality and 100% T	1.5	2.0	1.1	.2	1.5	1.0

*The mean composite scores are not exactly consistent with the mean profiles. The former were computed by averaging the composite scores for years 1, 2, and 3, while the latter were actually three-year profiles; that is, the mean score for each profile element was determined for the full three-year period. The metric on the composite scores cannot be compared directly with that of the element means of the profiles, but the consistency of the mean composite scores with the group profiles is clear.

001000 (favorable on all measures except N - nonopioid use, which was scored as moderate) and 202121 (unfavorable on all measures except O - opioid use); the composite scores for these two profiles were 13 and 75, respectively (on the scale of 0 to 100). These differences illustrate the critical difference between the composite score, which is primarily oriented to level of favorableness of overall outcome, and the outcome groups, which focus on distinctive patterns of outcome. In the case of Group 8 the distinctive pattern involves moderate to heavy use of nonopioids combined with little or no use of opioids. In the total followup sample, the profiles of these nonopioid only individuals formed a cluster in which the pattern of illicit drug use overrode other differences. The distinctive patterns of the other outcome groups are indicated in Table 3.

Despite the fact that the composite scores and outcome groups were both derived from the EONACT profiles and are highly related to each other, they illustrate independent aspects of the outcome profiles. The overall score of favorableness of outcome is not necessarily indicative of the distinctiveness of a cluster of profiles characteristic of a particular group even though in the extreme groups the association is inescapable. Nevertheless, it is desirable to consider both the level of favorableness, expressed by the composite score, and the distinctive features of the profile, associated with the outcome group in the analysis of treatment effectiveness.

With respect to favorableness of outcome, the mean composite scores in Table 3 show a progressive shift from the most favorable level, in group 1, to the most unfavorable level, in group 7, despite variation in composite scores in some of the groups. In addition, there are some sharp discontinuities in the progression of composite scores, between groups 1 and 3, 2 and 8, 4 and 5, and 9 and 11, that suggest the possibility of combining groups to

reflect different levels of favorableness of outcome. For the analyses reported in this study, group 1 was combined with groups 3 and 2 to form a "favorable" level. However, inasmuch as group 1 was the only group with favorable scores on all measures, it might well be separated in larger samples.

The four general levels of outcome on a scale of favorableness listed below are used extensively in subsequent analyses in the present report:

Level 1 - Favorable Outcomes

composed of Groups 1, 3, 2 - 31.7% of total sample

main features: drug abstinence and little or no criminality

Level 2 - Moderately Favorable Outcomes

composed of Groups 8 and 4 - 21.3% of total sample

main features: moderate opioid or nonopioid use, but not both, moderate unemployment and moderate to total return to treatment

Level 3 - Moderately Unfavorable Outcomes

composed of Groups 5, 6, 9 - 31.5% of total sample

main features: moderate opioid use and little or no nonopioid use, with some criminality, unemployment, and return to treatment

Level 4 - Unfavorable Outcomes

composed of Groups 11, 10, 7 - 15.3% of total sample

main features: moderate to heavy drug use, criminality, unemployment, and return to treatment.

The distribution of the total sample by outcome levels enables some interesting observations. First, it is noteworthy that over 50% of the patients included in the followup study, regardless of treatment group, had outcome profiles for the first 3 years after DARP that were favorable or moderately favorable. The percentage at the favorable level (31.7%) was double that at

the unfavorable level (15.3%). These results are suggestive of generally favorable effectiveness for the DARP treatment sample, but do not take account of pre DARP status of patients or differences among treatment groups, which are considered later.

With respect to the qualitative aspects of the outcome group profiles, a number of important observations must be noted. First, it is apparent that the extreme groups, located at the favorable and unfavorable levels, are differentiated on the basis of opioid use and criminality primarily; unemployment and return to treatment appear at all four levels in one or more groups. Thus the criterion of effectiveness reflected by the outcome groups is defined by conformity to social standards and expectation on the dimension of acceptable versus deviant behavior related mainly to drug use. The same conclusion was drawn by Neman, Demaree, Hornick, and Sells (1977) who used the method of multiple discriminant analysis to identify pre DARP and during DARP (predictor) variables that discriminate among the outcome groups. In an extended series of multiple discriminant analyses these investigators found that the main dimension that differentiated favorable outcome from unfavorable outcome groups was defined by drug use and criminality. These results are utilized later in this report to predict outcome group classification in the comparison of effectiveness of the five treatment groups.

Groups 8 and 4, classified above as Moderately Favorable, are shown in Table 3 to have mean outcome profiles for the first 3 years after DARP treatment with little or no criminality and only light opioid or moderate nonopioid use, but not both. Group 4 and to a lesser extent, group 8, scored lower than the Favorable groups, mainly as a result of their levels on both unemployment and return to treatment. In view of the low level of criminality and the particular drug use patterns demonstrated, these groups appear to represent a slightly lower than Favorable (hence Moderately Favorable) outcome level

for nonopioid and polydrug users - in group 8, and for opioid users, in group 4. In addition, the profile of group 4 may well be the best that can be expected for many DARP MM patients who were unable to detoxify and had to return to treatment as a preferred alternative to pursuing a criminal, addict life style. This interpretation is strengthened by the absence of post DARP criminality in group 4 and by the emphasis on remaining in treatment advocated by many MM treatment leaders, as mentioned earlier.

Groups 5, 6, and 9, Moderately Unfavorable, demonstrated moderately deviant scores on employment, opioid use, criminality, and return to treatment; group 9 was moderately deviant on nonopioid use as well, which may explain its higher frequency. On alcohol use the mean scores were low and about the same as for all other groups. In terms of the number of elements on which deviant indications were found and also in terms of the magnitude of the mean scores, these three groups reflect moderately unfavorable performance, but less deviant than the following groups, in the Unfavorable category.

Groups 11, 10, and 7 comprised the Unfavorable category. On the elements, opioid use, nonopioid use, and criminality, group 11 had high scores on two -- opioid and nonopioid use (1.7 and 1.5), group 10 had high scores on two -- opioid use and criminality (1.5 and 2.0), and group 7 had high scores on the same two (2.0 and 1.5). In addition, group 11 had moderately high unemployment and had 60% who reentered in treatment, group 10 had high unemployment and moderate nonopioid use, and group 7 had these as well as 100% who reentered treatment.

Chapter 3

PROCEDURES FOR OUTCOME COMPARISONS OF TREATMENT GROUPS

The focus of the present study is on outcomes in relation to the kind of treatment received during DARP. Comparsons of outcomes for individuals in the five treatment groups would have been simplified if individuals had been assigned to the groups randomly. In that case it could have been assumed that each of the treatment groups was on an equal footing initially in terms of the characteristics of its patients, and any differences in outcomes might then have been ascribed to the kind of treatment received or to interactions between particular characteristics of patients and the treatment received.

For a number of reasons, however, randomized assignment to treatment was not feasible, and as a result, many differences in patient characteristics were found between the groups. As a consequence of this, outcomes may have differed among the groups as a function of differing patient characteristics, quite apart from the treatments received. In brief, the effects of patient characteristics and treatment were intertwined in such a way that attempts to appraise the effects of treatment alone presented a major problem.

An approach that was at least partially successful in overcoming this problem involved the prediction of outcomes based on expected values computed without regard to the particular modality or type of treatment received During DARP. Predictions were based on a method that took account of variables that had been found to be significantly related to outcomes in a series of multiple discriminant analyses reported in a companion study to this by Neman, Demaree, Hornick, and Sells (1977). This method is described in detail below. Aggregation of the predicted outcomes by treatment group provided a standard

for each group and enabled the comparisons in terms of deviations of actual outcomes from the predicted standard. In principle, this approach could be considered as a means of taking into account the varying patient characteristics of the separate treatment groups and it represented an effort to control these variations in the assessment of the effectiveness of the DARP treatments.

Although this approach is believed to be sound, it can also be considered as lacking precision for reasons pointed out in the following discussion and in the studies of Hornick et al. (1977) and Neman et al. (1977) in which major portions of the methodology used here were developed. Further analyses were performed that are described briefly in the last section of this chapter, based on the general logic of the prediction approach. These involved a partitioning of samples on the basis of selected control variables and comparison of subsamples differentiated according to specific hypotheses. The samples included in all of the analyses were restricted to Black and White males for whom there were subsamples in all five treatment groups. Males in other ethnic groups (Mexican-American and Puerto Rican) and females were included in the total followup sample, but were not available in all five treatment groups followed in the present study.

Variables Available for Prediction of Outcome

The model employed in the DARP followup studies regarded the following domains as relevant sources of influence on post DARP outcomes: (a) DARP treatment; (b) patient demographic characteristics; (c) patient developmental background factors; (d) pre DARP treatment; (e) baseline levels on the outcome criterion measures, reflecting status at the time of admission to treatment; (f) patient performance on the same and related outcome criterion dimensions

during DARP treatment; and (g) contextual environmental factors during and particularly after DARP treatment. A major task in the evaluation research has been to separate effects attributable to treatment per se from those attributable to the other factors. Methodology related to this general task has been discussed in Sells (1974 a, b), Sells and Simpson (1976 a, b, c), and Sells, Demaree, Simpson, Joe, and Gorsuch (1977).

While the variables assembled to implement this model are believed to capture a major portion of the variance related to the domains enumerated, there were shortcomings in implementation that could not be avoided. One was the absence of any measure of program capability. Plans have been developed to address this problem; however, in the present research the data for every program represented in a treatment have been considered as reflecting equal program capability, even though variations in capability among the DARP programs in every treatment area were considered very likely. Another includes numerous and diverse situational-environmental contextual factors that affect individuals and programs differentially. Although beginnings have been made in this area by the DARP staff (e.g., Singh, 1977; Joe, Singh, Finklea, Hudiburg, and Sells, 1977), it was not feasible to include such measures in the present study.

The variables that represent individual characteristics and pre DARP influences have been defined elsewhere (Simpson, Savage, Lloyd, and Sells, 1977) and are believed to include the major pre DARP predictors of later performance. They consist of ethnic group, age, background criminality, background socioeconomic status, background family responsibility, pre DARP treatment, baseline street addiction, and baseline nonopioid use (see Table 4). The last two variables were based on employment, drug and alcohol use, and illegal support during the 2-month period preceding admission to treatment.

Table 4. Variables Included in the Followup Research Cohorts 1 and 2

DARP treatment modality	MM TC DF DT (OP)
comparison group type[1]	IO
	MM-A TC-T DF-A DT-OP
	MM-CO TC-ST,M DF-CO
Demographic characteristics	Age at admission
	Race/ethnic group B, PR, MA, W
	Sex M,F
Background factors[2]	Criminality (Crim. Hist. and Age at onset of drug involvement)
	SES (Pat. educ. and parent's SES)
	Soc. Resp. (Empl. Hist. and Fam. Dep.)
Pre DARP treatment	Chemical (MM or DT)
	Non-chemical (TC, DF, Other)
Baseline factors[2] (Generally 2 mos. preced. adm.)	Nonopioid use (Mari. and Nop.)
	Street Addiction (Op, E. Illeg. Sup.)
During DARP factors[2] (Specific definition vary by modality)	Social Deviance (Op, Nop, E, Crim.)
	Alc.-Mari. Use
	Days in Treatment (Completed or referred vs. Terminated -- quit, expelled, or jailed)
Post DARP criteria (Adjusted for time at risk)	Drug Use (Op. Nopm Mari, Alc)
	Arrests, Jail
	Employment
	Treatment
	Mos. Unsupervised
	Composite Score, based on EONACT profile
	Outcome Groups (11 groups)

[1]Not included in the present study
[2]Based on Simpson, Savage, Lloyd, and Sells (1977)

The performance of individuals during DARP was reflected by four variables -- Favorableness of Termination, Days in Treatment, Social Deviance, and Alcohol-Marihuana use. The scores on all except the first of these variables were expressed in standard form (mean of 0 and standard deviation of 1) separately for each of the three treatment groups (MM, TC, and DF) for which during-treatment measures were available. This ruled out any differences between treatment groups on the variables measured. Type of termination, on the other hand, was scored on a 3-point scale and on this scale, differences were allowed between treatment groups.

Method for Predicting Classification in Outcome Groups

Predictions of the outcome groups expected for individuals were based on demographic, background, and pre DARP variables. In later analyses, during DARP performance measures were also included. Although the predictions in each analysis were derived from a multiple discriminant analysis, the method employed can be regarded as a canonical correlation analysis in which one set of variables consists of the predictors while the other set consists of dummy variables which denote the outcome groups to which individuals belonged.

Viewed in terms of a discriminant analysis, the first discriminant function is a composite (weighted sum) of the scores on the predictors which maximally separates the groups relative to the dispersion of the composite within groups. Viewed as a canonical analysis, the composite is called the first canonical variate and is that combination of the predictors which provides the most accurate prediction of group membership in a particular sample. While additional discriminant functions (or canonical variates) can ordinarily be

defined, up to the lesser of the number of predictors or the number of groups minus one, sharp drops are typically found in the discrimination (or prediction) yielded by the second and later functions, compared to the first. It also is fairly common for discriminant functions (or canonical variates) subsequent to the first, even when statistically significant, to be difficult to interpret.

For the foregoing reasons only the first discriminant function was used to predict classification in the 11 outcome groups. In the present research involving different samples of patients, the first discriminant function generally ordered the outcome groups according to favorableness of outcome, with emphasis on opioid use and criminality. This result is especially noteworthy, because it was determined empirically and not foreordained or dictated in any manner. Another result of importance was the high degree of plausibility of the predictors that showed up most strongly in the definition of the first discriminant function.

The method for predicting group classification based on the first discriminant function can be illustrated readily for an analysis involving only two groups, designated A and B. Suppose that there are 40 persons in Group A and 60 in Group B, and that the criterion variable for group classification has a value of 0 for all individuals in Group A and a value of 1 for all individuals in Group B. The discriminant function then formed is the composite of the independent variables or predictors which is maximally correlated in the sample at hand with the 1, 0 criterion representing group membership. Under the constraint that the number predicted to be in Group A is the same as the number actually in this group, and similarly for Group B, the 40 persons with the lowest scores on the discriminant function would be

predicted to be members of Group A; the remaining 60 persons (that is, the 60 with the highest predicted scores) would be predicted to be members of Group B. A straightforward extension of this procedure was used for predicting membership in the 11 outcome groups.

An illustration of the procedures followed in the prediction of outcome group membership and the comparisons thus afforded of treatment groups may be helpful. For the present illustrative purpose a discriminant analysis was performed of the 11 outcome groups in the sample of 1923 Black and White males. Standard scores on two factors, background criminality and street addiction, were used as predictors. In this analysis these factors had virtually identical weight in defining the scores of individuals on the first discriminant function. The equation was

$$Z_{DF} = .64\ Z_{BC} + .65\ Z_{SA}$$

where

Z_{DF} is the standard score of an individual on the first discriminant function;

Z_{BC} is the standard score for that person on background criminality;

and

Z_{SA} is the standard score on street addiction.

The mean scores on the two predictors and the discriminant function were computed for the persons in each outcome group and the results are shown in Table 5. The canonical correlation associated with this discriminant function was significant ($\chi^2 = 162$; 20 df) at or beyond the .001 level and had a value of .26.

It is clear from Table 5 that the discriminant function separated the 11 groups according to favorableness of outcome. Groups 1, 8, 2, and 3,

Table 5. Mean Standard Scores of 11 Outcome Groups on Two Factors (Background Criminality and Street Addiction) and the Discriminant Function Defined by the Factors.

Sample: Black and White Males, Cohorts 1 and 2 combined; N = 1923.

	Groups[1]										
Variable	1	8	2	3	4	9	6	11	5	7	10
Background Criminality	-.21 L	-.10	.02	-.16 L	-.06	-.10	.04	.14	.18 H	.31	.68 H
Street Addiction	-.26 L	-.26 L	-.26 L	-.05	.00	.13 H	.01	.02	.24 H	.45 H	.35 H
Discriminant Function	-.31 L	-.24 L	-.15	-.14	-.04	.02	.04	.11	.28 H	.49 H	.68 H
N	304	200	119	174	191	284	144	114	190	121	82

[1]Groups arranged according to mean scores on the discriminant function; each value (mean standard score) accompanied by an L (low) or H (high) departs from 0 at or beyond the .05 probability level.

which had generally favorable outcomes, received the four lowest mean scores, respectively, on this function, while groups 10, 7, 5, and 11, with generally unfavorable outcomes, had the four highest mean scores, respectively.

The prediction of group classification began with group 1, composed of 304 individuals, which had the lowest mean score on the discriminant function. Based on the discriminant scores and without any knowledge of the groups into which individuals actually fell, the problem was to select from the total sample of 1923 the 304 persons considered to be the most likely candidates for classification in group 1. Since the 304 individuals who were actually in group 1 had the lowest mean score, the 304 with the lowest scores on the discriminant function were the ones predicted to be in group 1. This procedure, it may be noted, is analogous to that described earlier for the case of only two groups.

In principle, the 304 predicted to be in group 1 are set aside, and consideration then turns to the group with the next-to-the-lowest mean score on the discriminant function. In the present illustration this was group 8 with 200 members. By application of the same logic as before, the 200 persons with the lowest discriminant scores in the residual sample of 1619 (i.e., 1923-304) were predicted to be in group 8.

The procedure just described was continued until predictions had been made for all 11 outcome groups. It should be mentioned that these predictions would have been the same if they had started with group 10 which had the highest mean score on the discriminant function. An uncertainty in the prediction procedure did arise when the mean scores on the discriminant function were equal for two or more outcome groups. However, by calculating

the mean scores to a sufficient number of decimal places, ties were avoided and thus the groups could always be ranked or ordered according to the mean scores. When two or more of these scores were virtually the same, however, such a ranking was unproductive and introduced a degree of arbitrariness into the prediction procedure. The same problem arose in predicting the outcome groups for individuals. When individuals had discriminant scores which fell on the boundaries between groups, they could have been predicted to be in any one of two or more groups. The problems just described are commonplace in prediction studies; in the present study they reflect the overlap among the groups, which was discussed by Hornick et al. (1977).

Procedures for Comparing Actual and Predicted Outcomes

Comparisons of the outcome group distributions across DARP treatment groups were made in two stages. In the first stage the outcome group distribution for each treatment group was compared with the distribution for all treatment groups combined. In the second stage the comparison was with the distribution expected on the basis of predicted classification in the outcome groups. The rationale and procedure for these comparisons are described in this section.

Outcome group distribution for a treatment group, in comparison to the total sample. Initially the percentage (designated A) of a treatment group actually falling into each of the outcome groups was compared with the percentage of the total sample of Black and White males in the respective outcome groups. The percentages for the total sample, designated T, are the values of A which would be expected if (a) patients had been assigned randomly to the treatment groups, and (b) the treatments represented by the groups had been equally influential on outcomes. Since it is clear that the first of these two

conditions was not met, the comparison of A with T (which does not take differences in patient characteristics into account) is by itself insufficient to make an adequate assessment of outcomes.

Actual and predicted outcome group distributions, by treatment groups. Upon predicting the outcome groups into which individuals in a sample would fall, it was a simple matter to count the number in each treatment group who were predicted to be in each outcome group. These numbers were then expressed as percentages of the total numbers in the respective treatment groups. The percentage of a treatment group expected, i.e., predicted to fall into a particular outcome group, was designated E, in contrast to A, the actual percentage in the group.

For each treatment group A and E percentages were available for each of the 11 outcome levels. In addition, the percentage across all treatment groups (T for the total sample) was available for each outcome group and level. The ratio A/T was selected as a means of comparing the percentage of a treatment group in any outcome group with the overall percentage for the total sample. When the two were equal, the value of A/T would be 1.00. When a treatment group percentage was lower than the corresponding total group percentage, A/T would be less than 1.00 and when a treatment group percentage exceeded the corresponding total group percentage, it would be greater than 1.00. However, as explained, A/T reflects the influence of many factors in addition to that attributable to DARP treatment per se and the E percentages were developed to measure the influence of factors other than DARP treatment. In some respects, E is akin to a handicap in golf. A closer analogy is the

practice in schools of setting a target (i.e., expected level) for achievement, based on measures of scholastic ability and prior achievement. In this context it is customary to compare actual achievement (A) with expected achievement (E) by the difference score, A-E.

In the present study the focus is on group comparisons, and raw differences between percentages were too difficult to interpret and explain in view of the many comparisons involved. Another method considered was to compute a pair of ratios -- A/T and A/E -- for each treatment outcome group. This appeared to be easier to interpret since every ratio could be evaluated in relation to par (1.00). However, after extensive study, this twin ratio method was also abandoned because of difficulties encountered in presentation and explanation. The A/E ratio proved to be highly sensitive to small variations in E percentages and was based on a different denominator than A/T; as a result, the numerical values often appeared erratic in magnitude although accurate in direction.

The method finally adopted to evaluate the A and E percentages involved the computation of two indices, both based on the outcome group (or level) T percentage as the denominator. These were A/T, as explained above, and (A-E)/T, which is equivalent to A/T-E/T and is interpreted as an index of treatment influence.

The rationale for the index (A-E)/T is as follows. A/T compares the actual frequency of a treatment group in an outcome group with the overall frequency of the total sample in that outcome group. E/T compares the frequency expected on the basis of selected nontreatment predictors with the percentage for the total sample. In other words, E/T indicates the frequency in an outcome group expected regardless of treatment in relation to the total

sample percentage. The difference between the two ratios reflects the excess or shortfall of patients in a particular outcome group that is not attributable to extraneous (independent) factors and therefore is presumed to represent treatment effect. No simple test of significance of this index was available in this context; instead of chi-square or other analyses of every index, the results are interpreted conservatively and in terms of logical consistency, following general guidelines set forth below.

For A/T, par equals 1.00 and for (A-E)/T, par equals zero. When values reported for these indices deviate from par by less than $\pm$ .10 they are considered not significant; then it can be concluded that the results for the treatment represented do not differ from those of the total sample (all treatments combined) and that they are predictable without reference to treatment. Variations greater than $\pm$ .10 are interpreted according to the magnitude and direction of the two indices considered, as in the schemas below. Further discussion of interpretation is given in the subsequent chapters in the presentation of the results.

Interpretation of results for outcome groups (1, 3, 2, 8, and 4) and outcome levels (I and II) in the favorable range is summarized in the following schema in which +, 0, and - notations are used to indicate favorable to unfavorable ranges for A/T and effective to ineffective ranges for (A-E)/T. The values for A/T are used to define rows in the 3x3 chart and they appear in the upper half of each cell in the chart. Those for (A-E)/T define columns and appear in the lower half of each cell. The most favorable cell is defined by the intersection of A/T>1.10 and (A-E)/T>+.10 and is indicated by $^{+}_{+}$ in the upper right-hand corner of the chart. The most unfavorable cell is indicated by $^{-}_{-}$ in the lower left-hand cell.

(A-E)/T

Rows A/T Columns (A-E)/T	≤-.10	-.09 to +.09	≥+.10	
≥1.10	+ -	+ 0	+ +	A/T more favorable than Total sample
.91 to 1.09	0 -	0 0	0 +	A/T not different from Total sample
≤.90	- -	- 0	- +	A/T less favorable than Total sample
	Treatment effect below expectancy	Treatment effect as expected	Treatment effect above expectancy	

A/T

The same type of schema, but with reversed interpretation is used for outcome groups 5, 6, 9, 11, 10, and 7 and outcome levels III and IV, in the unfavorable range. Here the most favorable cell is in the lower left-hand corner and the most unfavorable cell in the upper right-hand corner. This second schema is as follows:

(A-E)/T

Rows A/T Columns (A-E)/T	<-.10	-.09 to +.09	>+.10	
>1.10	- +	- 0	- -	A/T less favorable than Total sample
.91-1.09	0 +	0 0	0 -	A/T not different from Total sample
<.90	+ +	+ 0	+ -	
	Treatment effect above expectancy	Treatment effect as expected	Treatment effect below expectancy	

A/T

In actual practice the interpretation of results suggested by the foregoing schemas should be viewed as illustrative rather than as prescribed by rigid rules. The most effective interpretation should view the data set in a table as a whole, comparing indices across treatments for outcome groups or levels or across outcome groups or levels within treatments. Then the specific values of A/T and (A-E)/T that are reported can be judged in relation to the patterns that they disclose rather than as discrete data. For example, in Table 8, below, the values of A/T and (A-E)/T for treatment groups at outcome level I are as follows:

Outcome Level I	MM	TC	DF	DT	IO
A/T	.95	1.19	1.11	.63	.68
(A-E)/T	+.09	+.08	+.02	-.49	-.36

Here the A/T ratios indicate that the actual frequencies at this most favorable outcome level were above average in TC, moderately above average in DF, well below average in DT and IO, and not significantly below average in MM. However, when paired with (A-E)/T, the data show mainly that DT and IO were not only well below average, but also well below expectancy for level I. The ratios for MM are both nonsignificant, according to the conventions suggested, but fit in with the idea that while the MM frequency at level I is slightly below average, it is also marginally in excess of expectancy. By itself, this result should not be accepted as significant, but in comparison with other data it may well fit a pattern, as discussed later, in Chapter 4. The (A-E)/T ratio for TC is also marginal, but may be judged with greater confidence in relation to additional information, as also discussed in Chapter 4.

Analyses Completed

Using the procedures outlined, three major analyses have been completed that bear on the comparative effectiveness of the DARP treatments. These were based on the subsample of 2178 Black and White males described in Table 1 and are described as follows:

1. Comparison of five treatment groups -- MM, TC, DF, DT, and IO, in a subset of 1923 Black and White males with complete pre DARP data. In this analysis, expected values (E) were computed on the basis of nine pre DARP independent variables, described in Chapter 3. This analysis is reported in Chapter 4.

2. Comparison of three treatment groups -- MM, TC, and DF, in three related analyses, as follows:

a. treatment samples identical to those for the same treatments as in analysis 1; expectancy based on nine pre DARP variables (N=1627);

b. treatment samples reduced by elimination of 224 patients with incomplete during DARP data; expectancy based on nine pre DARP variables (N=1403);

c. same as 2b.; expectancy based on 13 independent variables (nine pre DARP variables plus four during DARP variables), N=1403.

3. Comparison of three treatment groups -- MM, TC, and DF, same sample as 2b. and 2c., partitioned into three subgroups: (1) daily opioid users at admission, labeled current addicts (N=1001); (2) history of daily opioid use, but not using daily at admission, labeled former addicts (N=277); (3) others, labeled nonaddicts (N=125).

Chapter 4

RESULTS FOR FIVE TREATMENT GROUPS, BLACK AND WHITE MALES

Outcome Comparisons of Five Treatment Groups: A vs. T

The percentage (T) of the total sample of 1923 Black and White males in Cohorts 1 and 2 and the percentage (A) of each of the five DARP treatment groups falling into each of the 11 outcome groups are given in Table 6. In this table, as well as in other tables appearing later, the 11 outcome groups and five outcome levels are ordered according to favorableness of post DARP outcome, as indicated in Table 3. Table 7 presents the ratios A/T (actual percentage in each group divided by the corresponding percentage in the total sample). For quick reference, Table 6 contains an abbreviated profile description for each outcome group and level.

Examination of the T percentages for outcome levels in the lower panel of Table 6 shows that nearly one-third (31%) of the total sample had predominantly favorable outcomes, while only about one-sixth (16%) had generally unfavorable outcomes. The remaining half (51%) had outcomes which were mixed as to favorableness or unfavorableness. When these results are compared for the treatment groups it appears that MM, TC, and DF each had at least twice as many at the Favorable level (I) than at the Unfavorable level (IV). In DT and IO, however, this was reversed; there were more Unfavorable than Favorable outcomes in both groups.

Proceeding further, with T referring to the percentage in the total sample, it is noteworthy that the MM, TC, and DF percentages at levels III and IV were close in value to T, while the corresponding percentages for DT and IO were decidedly greater than T. Turning to the Favorable level (I), the percentage in MM did not differ materially from T; the percentages for TC and DF

Table 6. Percentage Distribution of Outcome Groups and Outcome Levels by Treatment Groups. Black and White Males, Cohorts 1 and 2. (N = 1923).

Outcome Groups

Group No.	Abbreviated Profile Description	Percentage by Group					
		T* (Total)	MM	TC	DF	DT	IO
1.	Abstin., Fav. Overall	15.8	13.2	22.0	20.3	6.5	5.6
3.	Abstin., Fav. exc. E	9.1	8.3	9.5	11.6	8.5	7.7
2.	Abstin., Fav. exc. 100% T	6.2	8.0	5.4	2.5	4.6	7.7
8.	No Op., High to Mod. N	10.4	10.1	10.0	14.1	7.8	9.8
4.	Op. w no Nop., no C, 100% T	9.9	15.5	5.9	5.8	7.8	6.3
5.	Mod. to High Op., no Nop., Mod. C	9.9	9.6	10.0	9.1	10.5	11.8
6.	Mod. to High Op. no Nop, C	7.5	8.0	5.6	7.1	9.8	11.2
9.	Op., Nop., C	14.8	13.1	15.5	14.9	19.0	15.4
11.	Mod. to High Op., Nop., C	5.8	5.3	6.0	4.2	8.5	9.1
10.	Mod. to High Op., High C	4.3	3.4	4.9	4.2	6.5	4.2
7.	High Op., High C, 100% T	6.3	5.4	5.2	6.2	10.5	11.2
N		1923	773	613	241	153	143

Outcome Levels

I	Favorable	31.1	29.5	36.9	34.4	19.6	21.0
II	Moderately Favorable	20.3	25.6	15.9	19.9	15.6	16.1
III	Moderately Unfavorable	32.2	30.8	31.1	31.1	39.3	38.4
IV	Unfavorable	16.4	14.1	16.1	14.6	25.5	24.5
N		1923	773	613	241	153	143

*The T percentages for this table, based on 1923 Black and White males, differ slightly from those in Table 3, based on the total followup sample.

exceeded T; and those for DT and IO were decidedly lower than T. Concerning level II, Moderately Favorable, the MM percentage was greater than T, while those for TC, DT, and IO were somewhat lower than T. These results are reflected in the A/T ratios in Table 7 (ratios that were judged to represent significant variations above or below T are indicated by the superscripts, a - above and b - below).

The results by outcome level suggest a major difference in treatment effectiveness between the three major modalities, MM, TC, and DF, which appeared to have generally favorable outcomes overall, and DT and IO, which appeared to have generally unfavorable outcomes. As emphasized previously, however, these are only gross indications; they do not reflect the adjustments, presented later, for population differences among the treatment groups. Nevertheless they are of much interest and invite closer scrutiny of the results for the outcome groups before proceeding to further analysis. The general pattern of outcome group ratios in Table 7 is consistent with the observations above for outcome levels, but reveals some further insights concerning outcome patterns associated with treatment groups, as follows:

MM. This group exceeded the average (T) to an extent judged significant in two outcome groups, 2 - Favorable and 4 - Moderately Favorable (Table 7), both of which involved 100% return to treatment. As suggested earlier, group 4 appeared to represent a particularly likely outcome profile for MM and this is supported by the fact that the percentage of MM patients in group 4 (15.5%) was both highest among the 11 outcome groups within MM and also 2 to 3 times as high as that in any other treatment group. In the unfavorable range three of the MM outcome groups were significantly below par and two of the remaining three were also below par.

Table 7. Ratios (A/T) of Actual to Total Percentages in Outcome Groups and Outcome Levels for each Treatment Group

		A/T Ratios by Treatment Group				
		MM	TC	DF	DT	IO
Outcome Group	1	.84[b]	1.39[a]	1.28[a]	.41[b]	.35[b]
	3	.91	1.04	1.27[a]	.93	.85[b]
	2	1.29[a]	.87[b]	.40[b]	.74[b]	1.24[a]
	8	.97	.96	1.36[a]	.75[b]	.94
	4	1.57[a]	.60[b]	.59[b]	.79[b]	.64[b]
	5	.97	1.01	.92	1.06	1.19[a]
	6	1.07	.75[b]	.95	1.31[a]	1.49[a]
	9	.89[b]	1.05	1.01	1.28[a]	1.04
	11	.91	1.03	.72[b]	1.47[a]	1.57[a]
	10	.79[b]	1.14[a]	.98	1.51[a]	.98
	7	.86[b]	.83[b]	.98	1.67[a]	1.78[a]
Outcome Level	I	.95	1.19[a]	1.11	.63[b]	.68[b]
	II	1.26[a]	.78[b]	.98	.77[b]	.79[b]
	III	.96	.97	.97	1.22[a]	1.19[a]
	IV	.86[b]	.98	.89[b]	1.55[a]	1.49[a]

[a] A/T judged as exceeding 1.00 to a significant extent ($\geq$1.10)

[b] A/T judged as below 1.00 to a significant extent ($\leq$.90)

TC. TC had an A/T ratio of 1.39 in outcome group 1 and was low (.60) as expected in group 4, as well as group 2. In other respects, the TC groups did not vary systematically from par.

DF. DF had A/T ratios of 1.28 and 1.27 in groups 1 and 2 and of 1.36 in group 8, indicating a surplus of favorable outcomes. The DF ratios were low in groups 2 and 4, as were those for TC. Prior to adjustment for population factors, the outcomes for DF thus look quite favorable.

DT and IO. Both of these treatment groups had A/T ratios below par in the Favorable and Moderately Favorable range and greater than par in the Moderately Unfavorable and Unfavorable range. These ratios were lowest in group 1 and highest in group 7.

If the foregoing results, based on the comparisons of A and T, were the only information available concerning the relative effectiveness of the DARP treatments, one would conclude that (a) the outcomes for the three major modalities, MM, TC, and DF, were decidedly superior to those for outpatient detoxification, DT, and the no-treatment comparison group, IO; (b) that MM, TC, and DF had comparable outcomes on the unfavorable side, but that (c) TC and DF showed up best in outcome group 1, the most favorable group, while (d) the decided excess of MM in outcome group 4 (characterized here as moderately favorable) was consistent with the expectation pointed out earlier, based on the reputed emphasis in many MM programs on elimination of criminality and remaining in or readmission to treatment, as well as the tolerance of occasional "chipping." The question to be asked about these conclusions is to what extent would they be altered by taking account of differences between the DARP treatment groups in characteristics of their respective patients. This is considered next.

Outcome Comparisons of Five Treatment Groups: A/T and (A-E)/T

In this analysis the A/T ratio for each treatment group in each outcome group (and level) was examined in relation to the ratio, (A-E)/T, following the rationale outlined in Chapter 3. The discriminant function that guided the prediction of outcome group classification was identical to that for Black and White males in all treatments described by Neman, Demaree, Hornick, and Sells (1977) except for the omission of the dummy independent variables that identified the five treatment groups. These were omitted since the intent of the method employed here was to disregard DARP treatment initially in the classification of predicted outcome group. The resulting MDA included independent variables (ethnic group; age at DARP admission; background criminality; background socioeconomic status; background social responsibility; pre DARP treatment, chemical - MM or DT, and non-chemical - TC; DF; other; baseline nonopioid use; and baseline street addiction). The MDA results were virtually unchanged in the present analysis.

The distribution of expected percentages, E, by treatment group and outcome level is presented in Table 8, which also includes the corresponding values of A, A/T, and (A-E)/T; Table 9 shows the same data, in greater detail, for outcome groups. The outcome level results summarized in Table 8 indicate no cause for a change in interpretation concerning the status of DT and IO; in both cases the values of A/T and (A-E)/T were significantly below par for the two favorable outcome levels (I and II) and above par for the two unfavorable outcome levels (III and IV). For DF, these results, reflecting expectation based on the nine pre DARP variables, were considerably less favorable than those

Table 8. Distribution of T Percentages by Outcome Level, A and E Percentages by Outcome Level and Treatment Group, and Corresponding A/T and (A-E)/T Ratios for MM, TC, DF, DT, and IO groups. Sample - 1923 Black and White Males, DARP Cohorts 1 and 2.

			Percentages and Ratios by Treatment Group				
Outcome Level	Index	T	MM	TC	DF	DT	IO
I	A	31.1	29.5	36.9	34.4	19.6	21.0
	E		26.6	34.4	33.7	34.7	32.9
Favorable	A/T		.95	1.19	1.11	.63	.68
	(A-E)/T		+.09	+.08	+.02	-.49	-.36
II	A	20.3	25.6	15.9	19.9	15.6	16.1
	E		17.0	19.8	29.8	21.6	23.8
Moderately	A/T		1.26	.78	.98	.77	.79
Favorable	(A-E)/T		+.42	-.19	-.49	-.30	-.38
III	A	32.2	30.8	31.1	31.1	39.3	38.4
	E		37.6	29.4	27.8	31.4	22.4
Moderately	A/T		.96	.97	.97	1.22	1.19
Unfavorable	(A-E)/T		-.21	+.05	+.10	+.25	+.50
IV	A	16.4	14.1	16.1	14.6	25.5	24.5
	E		19.0	16.5	8.7	12.4	21.0
Unfavorable	A/T		.86	.98	.89	1.55	1.49
	(A-E)/T		-.30	-.02	+.36	+.80	+.21
N		1923	773	613	241	153	143

Table 9. Distribution of T Percentages by Outcome Group, A and E Percentages by Outcome Group and Treatment Group, and Corresponding A/T and (A-E)/T Ratios for HI, TG, DF, DF, and IO groups. Sample - 1923 Black and White Males, DARP Cohorts 1 and 2.

Outcome Group	Index	T	Percentages and Ratios by Treatment Group				
			HI	TG	DF	DF	IO
1	A	15.8	13.2	22.0	20.3	6.5	5.6
	E		11.5	18.1	20.8	19.0	17.5
	A/T		.84	1.39	1.28	.41	.35
	(A-E)/T		+.11	+.25	-.03	-.79	-.76
3	A	9.1	8.3	9.5	11.6	8.5	7.7
	E		9.1	9.0	8.3	9.8	9.8
	A/T		.91	1.04	1.27	.93	.85
	(A-E)/T		-.09	+.05	+.40	-.14	-.23
2	A	6.2	8.0	5.4	2.5	4.6	7.7
	E		6.0	7.3	4.6	5.9	5.6
	A/T		1.29	.87	.40	.74	1.24
	(A-E)/T		+.32	-.31	-.34	-.21	+.34
8	A	10.4	10.1	10.0	14.1	7.8	9.8
	E		5.2	11.6	23.6	10.5	11.2
	A/T		.97	.96	1.36	.75	.94
	(A-E)/T		+.47	-.15	-.91	-.26	-.13
4	A	9.9	15.5	5.9	5.8	7.8	6.3
	E		11.8	8.2	6.2	11.1	12.6
	A/T		1.57	.60	.59	.79	.64
	(A-E)/T		+.37	-.23	-.04	-.33	-.64
5	A	9.9	9.6	10.0	9.1	10.5	11.8
	E		12.0	9.8	6.2	6.5	8.4
	A/T		.97	1.01	.92	1.06	1.19
	(A-E)/T		-.24	+.02	+.29	+.40	+.34
6	A	7.5	8.0	5.6	7.1	9.8	11.2
	E		8.4	7.2	5.0	10.5	4.9
	A/T		1.07	.75	.95	1.31	1.49
	(A-E)/T		-.05	-.21	+.28	-.09	+.84
9	A	14.8	13.1	15.5	14.9	19.0	15.4
	E		17.2	12.4	16.6	14.4	9.1
	A/T		.89	1.05	1.01	1.28	1.04
	(A-E)/T		-.27	+.24	-.11	+.31	+.43
11	A	5.8	5.3	6.0	4.2	8.5	9.1
	E		7.4	5.1	2.9	6.5	6.3
	A/T		.91	1.03	.72	1.47	1.57
	(A-E)/T		-.36	+.16	+.22	+.34	+.48
10	A	4.3	3.4	4.9	4.2	6.5	4.2
	E		4.7	4.6	2.9	2.0	5.6
	A/T		.79	1.14	.98	1.51	.98
	(A-E)/T		-.30	+.07	+.30	+1.05	-.33
7	A	6.3	5.4	5.2	6.2	10.5	11.2
	E		6.9	6.8	2.9	3.9	9.1
	A/T		.86	.83	.98	1.67	1.78
	(A-E)/T		-.24	-.25	+.52	+.105	+.33
N		1923	773	613	241	153	143

based on actual outcomes only. The excess of DF in level I (A/T=1.11) was paired with a nonsignificant treatment effect index ((A-E)/T=+.02) while the at par A/T ratio of .98 at level II was paired with a negative treatment effect index ((A-E)/T=-.49) of considerable magnitude; at the same time, the indices for levels III and IV indicated an excess of unfavorable outcomes over expectancy, although the ratio A/T at level IV was below par. In other words, the DF sample included a high proportion of "high handicap" patients who had favorable outcome profiles but did not exceed expectations; in general it must be concluded that the outcomes for DF were less favorable than predicted.

For TC, the A/T ratio was highest at level I (1.19), with a marginal treatment effect index ((A-E)/T=+.08). At level II, TC was below par on both indices, while in the unfavorable range, TC did not vary significantly from par on either index. MM had the most favorable results as shown by the following summary:

(MM)	A/T	(A-E)/T
Level I	.95	+.09
Level II	1.26	+.42
Level III	.96	-.21
Level IV	.86	-.30

According to these results, the MM outcomes exceeded expectation at both favorable levels, marginally at level I, but quite dramatically at level II as hypothesized, and were well below expectation at both unfavorable levels.

The general results by outcome levels, as shown in Table 8 indicated the most favorable outcomes for MM, marginally favorable outcomes for TC, unfavorable outcomes for DT and IO, and raised some questions concerning DF. More detailed information concerning the five treatment groups was obtained by examination of outcome groups, in Table 9. In this discussion each treatment group is considered separately.

MM. The paired ratios for MM were as follows:

	A/T	(A-E)/T
Outcome Group 1	.84	+.11
3	.91	-.09
2	1.29	+.32
8	.97	+.47
4	1.57	+.37
5	.97	-.24
6	1.07	-.05
9	.89	-.27
11	.91	-.36
10	.79	-.30
7	.86	-.24

Looking at this tabulation it appears that some interesting qualitative results regarding particular outcome profiles were masked in the aggregated data by level in Table 8. In the favorable range, A/T exceeded par in the two outcome groups, 2 and 4, in which return to treatment after DARP was a universal feature; further, this excess was most pronounced in group 4 which also involved some opioid use, but no criminality. Of the remaining favorable outcome groups, A/T for MM was significantly below par only in group 1, but here the treatment effect index indicated an excess over expectancy (+.11). The major favorable outcomes for MM were in groups 2 and 4; in the six unfavorable groups, A/T was below par in all but group 6 and the treatment effect index was negative in all six although again not significant for group 6.

Overall these results support highly favorable claims for the effectiveness of MM treatment. According to the A percentages in Table 8, 55.1% of the MM sample were in levels I and II. This can be compared with 51.4% in the total sample, but also with 43.6% expected. The latter must be emphasized since the

MM patient sample had the highest percentage of daily opioid users among the five treatment groups prior to admission to DARP treatment.

TC. The outcome group indices for TC were:

	A/T	(A-E)/T
Outcome Group 1	1.39	+.25
3	1.04	+.05
2	.87	-.31
8	.96	-.15
4	.60	-.23
5	1.01	+.02
6	.75	-.21
9	1.05	+.24
11	1.03	+.16
10	1.14	+.07
7	.83	-.25

The marginal performance of TC at level I shown in Table 8 does indeed mask some contradictory results. The tabulation above shows a very strong, favorable treatment effect in outcome group 1, where the A percent for TC was 22.0% (Table 9), exceeding the other four treatment groups. In group 3, TC was slightly above par, but not significantly, while in groups 2, 8, and 4, TC was both below par (except in group 8) on A/T and below expectation; groups 2 and 4, involving return to treatment, were apparently contraindicated for TC and group 8 (and also group 4) involved continued, although moderate drug use and were also inconsistent with TC ideals. In the unfavorable range two TC outcome groups were below par and also below expectation, indicating favorableness of outcome -- these were groups 6 and 7; three of the remaining groups (5, 9, and 11) were at par in frequency and one (group 10) was above par. Overall, the TC record in this sample, except for the favorable showing in group 1, was not discriminably better than expectation.

DF. For DF, the paired ratios were:

	A/T	(A-E)/T
Outcome Group 1	1.28	-.03
3	1.27	+.40
2	.40	-.34
8	1.36	-.91
4	.59	-.04
5	.92	+.29
6	.95	+.28
9	1.01	-.11
11	.72	+.22
10	.98	+.30
7	.98	+.52

The significant outcome results for DF are opposite to those for MM in that DF had an excess of patients in the most favorable group (group 1) but below expectation based on patient characteristics, whereas MM had fewer than par but more than expected at that level. The impressive results in group 3, which was favorable except for employment, are reasonable for the treatment group with the largest percentage of youth. The results for group 8 show an excess of DF patients, but far fewer than expected, while those for group 4 are reasonable for DF and around the expected level. Thus in the favorable range, DF showed a favorable treatment effect only in group 2, which included 11.6% of the DF sample (this was larger than the percentages in group 2 in any of the other treatment groups). In the unfavorable range, DF was at or slightly below par in all six outcome groups but well above expectation in five of the six. These results reflect the fact that the DF sample was less deviant at admission and had less distance to travel toward favorable outcomes, but that in general the DF patients fared poorly in this treatment compared to expectation.

DT. The DT patient sample was slightly less deviant than the MM sample (see Table 1) and the expected values for DT were somewhat more optimistic. However, the actual frequencies for DT showed a generally poorer outcome and the corresponding treatment effect index values not only failed to justify this optimism, but indeed provided a basis for concluding that this treatment in the present sample was ineffective. The A/T and (A-E)/T ratios for DT are displayed below:

		A/T	(A-E)/T
Outcome Group	1	.41	-.79
	3	.93	-.14
	2	.74	-.21
	8	.75	-.26
	4	.79	-.33
	5	1.06	+.40
	6	1.31	-.09
	9	1.28	+.31
	11	1.47	+.34
	10	1.51	+1.05
	7	1.67	+1.05

These data reinforce the observations reported earlier concerning the lack of effectiveness of DT based on the A/T ratios. With remarkable consistency, the treatment effect index (A-E)/T was negative for all of the outcome groups in the favorable range and positive for five of the six groups in the unfavorable range. The general impact of the results for DT is that of failure to produce results expected on the basis of prediction from patient characteristics. Thirty-five percent of the DT sample had outcomes in the first five (favorable) groups, compared with 56% expected. The conclusion indicated is that DT cannot be considered to be an effective treatment in the present sample.

IO. The two indices for the IO group were as follows:

		A/T	(A-E)/T
Outcome Group	1	.35	-.76
	3	.85	-.23
	2	1.24	+.34
	8	.94	-.13
	4	.64	-.64
	5	1.19	+.34
	6	1.49	+.84
	9	1.04	+.43
	11	1.57	+.48
	10	.98	-.33
	7	1.78	+.33

A similar, but less extreme picture can be drawn concerning IO. The overall results, shown in Table 8, identify IO (along with DT) as ineffective on the basis of the criteria used. IO was included in this study as an interesting, comparison group (although not a random control group) that received no DARP treatment. In the favorable range this sample showed an excess in only one outcome group (group 2, in which all patients returned to post DARP treatment); this involved only 10% of the IO patients. In the unfavorable range, there was an excess of IO patients in four of the outcome groups and only one of the unfavorable groups (group 10) was below expectation.

Concluding Comment. The analyses presented in this chapter have demonstrated a significant difference in outcomes between the three major modalities, MM, TC, and DF, on one hand, and the two remaining treatment groups, DT and IO, on the other. Viewed from the perspectives both of actual outcome distributions (A) and of comparison of actual with expected outcomes (A/T and (A-E)/T), the MM results were most favorable and the DT and IO were not in the same league as MM and TC. Although the A results for DF appeared to be quite

favorable, the analytic results placed DF in a position between the effective-appearing modalities (MM and TC) and the ineffective-appearing treatment groups (DT and IO) (see Table 9). The higher expectancy for DF in outcome groups 1 and 8, compared to the other four treatment groups, suggested that further analysis focused on differences between addicts (daily opioid users) and non-addicts (all others) might be informative. This was accomplished and is reported along with the other additional analyses in Chapter 5.

Chapter 5

FURTHER ANALYSIS OF MM, TC, AND DF OUTCOMES

Using the data in Table 9, rank order correlations were computed among the five treatment groups for A and E percentages in the 11 outcome groups. The squared correlations, in Table 10, show two clusters in the A data: The first includes MM, TC, and DF, with the highest rho squared, indicating close correspondence of A percentages between TC and DF; the second is between DT and IO. Correlations between treatment groups of the two clusters were low, ranging from .03 to .34. No comparable clustering was found among the E correlations, which reflect degrees of similarity among the expected outcome distributions based on predictions arising from pre DARP patient characteristics. The pattern of E intercorrelations suggests a cluster of TC, DF, and DT, with IO marginally related (by its correlations with TC and DF) and MM stands apart with positive but lower correlations with the other four.

The two A clusters can be thought of as representing the three modalities in which high percentages of favorable outcomes were produced versus the other two generally unproductive treatment groups. No similar clustering was evident in the E correlations although the MM group tended to stand apart from the other groups. Three of these groups -- TC, DF, and IO -- had the youngest mean age, the highest percentages of persons not using opioids daily at admission, the highest mean marihuana use, the lowest employment rates, and (for two of the three) the lowest arrest rates (see Table 1). These three groups thus had the highest percentages of nonaddicts among their patients and this may explain the differences between their E distributions and that of MM.

Table 10. Squared Rank Order Correlations Among A and E Percentages in 11 Outcome Groups for 5 Treatment Groups

Rho^2 - A Percentages

	TC	DF	DT	IO
MM	.52	.42	.00	.00
TC		.70	.05	.07
DF			.12	.09
DT				.75

Rho^2 - E Percentages

	TC	DF	DT	IO
MM	.39	.24	.47	.18
TC		.88	.61	.45
DF			.64	.47
DT				.37

Although the TC sample is frequently associated with daily opioid users (60% of them were in that category), it could best be described as a mixed group of addicts and nonaddicts; this was also true, to a greater degree, of DF.

Further analyses were indicated for the addict and nonaddict portions of the treatment groups. However, these were not feasible for the DT and IO samples, which included only 153 and 143 patients, respectively, and it was decided to restrict the remaining analyses to the three modalities for which generally positive results were obtained up to this point. In view of the (A-E)/T results in Chapter 4 that raised questions concerning DF, particular interest was focused on DF in these data.

In the further analyses it was possible to calculate expected percentages on the basis of 13 predictors rather than only nine as in Chapter 4. The nine predictors represented pre DARP variables: ethnic group; age at DARP admission; background criminality; background socioeconomic status; background social responsibility; pre DARP chemical treatment; pre DARP non-chemical treatment; baseline nonopioid use; and base[illegible]e street addiction. To represent during DARP performance in treatment, four additional variables were included: days in treatment; favorableness of DARP termination; social deviance; and alcohol-marihuana use. As already noted, these analyses required exclusion of DT, for which during DARP measures were generally incomplete, and also IO, for which no treatment data were available at all.

In order to compute the MDAs on which expected values depended, it was necessary to include only patients with complete during DARP records. The restriction of the MM, TC, and DF samples to patients with complete during DARP data required the elimination of records for 224 patients, 88 from MM, 98 from TC, and 38 from DF. The resulting samples were thus reduced from 1627

to 1403 (MM from 773 to 685, TC from 613 to 515, and DF from 241 to 203). Inasmuch as it has been found repeatedly in the DARP research that incomplete during DARP data were most characteristic of early dropouts, a check was made on the extent and direction of bias in the samples resulting from the elimination of patients with incomplete data (see also Simpson, Savage, Lloyd, and Sells, 1977). It was expected that these would be individuals for whom actual and predicted outcomes would be poor and that their elimination would tend to improve the actual and predicted outcomes in the remaining samples.

A striking difference was found for all three subsamples on days in DARP treatment, which confirmed the expectation. The mean standard scores, computed on the total sample of 1923 Black and White males, were as follows:

MM	Final Sample (N = 685)	.11
	Eliminated Subsample (N = 88)	-1.38
TC	Final Sample (N = 515)	.18
	Eliminated Subsample (N = 98)	- .90
DF	Final Sample	.09
	Eliminated Subsample (N = 38)	- .67

In addition, the eliminated MM patients had records of higher background criminality, higher baseline drug use, less pre DARP treatment, and they were younger on the average than the retained final sample. The TC and DF eliminees also had less pre DARP treatment than the final samples, but were less clearly defined on other variables.

In view of these results it was logical to expect that the actual as well as expected percentages of MM, TC, and DF in the 11 outcome groups would be affected by the elimination of the short-time patients. This was

investigated and it was found that the changes were not as drastic overall as anticipated, but those that did occur were important and need to be understood. The A and E percentages for the three treatment groups are shown for outcome levels in Table 11 and for outcome groups in Table 12, for three separate conditions:

(1) N = 1627 (MM, TC, and DF samples the same as in the five-treatment sample of 1923), E percentages based on nine pre DARP variables;

(2) N = 1403 (MM, TC, and DF restricted to patients with complete during DARP data), E percentages based on nine pre DARP variables;

(3) N = 1403 (same sample as (2)), E percentages based on nine pre DARP variables plus four during DARP variables.

Total sample percentages (T) for MM, TC, and DF combined are shown in the right-hand column of each table.

First, it should be noted that the T percentages became slightly more favorable each time the sample was reduced: (a) from 1923 (Table 6) to 1627 (Table 11) by elimination of 296 DT and IO patients, and (b) from 1627 to 1403 (Table 11) by elimination of 224 mainly short-term patients with incomplete during DARP records. This is shown in the following tabulation:

	N=1923 from Table 6	N=1627 from Table 11	N=1403 from Table 11
Outcome Level I	31.1%	33.1%	34.5%
Outcome Level II	20.3%	21.1%	21.5%
Outcome Level III	32.2%	30.8%	29.4%
Outcome Level IV	16.4%	15.0%	14.6%

It can be seen that in the process of sample adjustment required to proceed with the analyses, the base rates increased 3.4% at level I and 1.2% at

Table 11. A and E Percentages of MM, TC, and DF at 4 Outcome Levels, Under 3 Conditions: (1) N=1627, E based on 9 predictors; (2) N=1403, E based on 9 predictors; (3) N=1403, E based on 13 predictors.

	Sample/ Condition	MM		TC		DF		Total
		A	E	A	E	A	E	
Outcome Level I	(1)	29.5	31.1	36.9	33.8	34.4	37.3	33.1
	(2)	30.3	34.3	39.8	32.2	34.6	40.4	34.5
	(3)	30.3	33.3	39.8	33.8	34.6	39.9	34.5
Outcome Level II	(1)	25.6	17.7	15.9	22.2	19.9	29.5	21.1
	(2)	26.6	18.1	15.6	23.5	19.7	30.6	21.5
	(3)	26.6	22.3	15.6	21.3	19.7	19.2	21.5
Outcome Level III	(1)	30.8	34.7	31.1	29.4	31.1	22.8	30.8
	(2)	29.5	31.3	28.9	30.6	30.5	19.6	29.4
	(3)	29.5	31.6	28.9	28.6	30.5	24.6	29.4
Outcome Level IV	(1)	14.1	16.6	16.1	14.7	14.6	10.4	15.0
	(2)	13.6	16.2	15.7	14.6	15.2	9.3	14.6
	(3)	13.6	12.8	15.7	16.3	15.2	16.2	14.6

Table 12. A and E Percentages of MM, TC, and DF in 11 Outcome Groups, Under 3 Conditions: (1) N=1627, E based on 9 predictors; (2) N=1403, E based on 9 predictors; (3) N=1403, E based on 13 predictors.

		Sample/ Condition	MM		TC		DF		Total
			A	E	A	E	A	E	
Outcome Group	1	(1)	13.2	14.4	22.0	18.3	20.3	26.1	17.5
		(2)	14.3	17.5	24.7	18.8	21.7	25.6	19.2
		(3)	14.3	16.8	24.7	20.4	21.7	24.1	19.2
	3	(1)	8.3	10.5	9.5	8.5	11.6	7.1	9.2
		(2)	7.7	9.8	9.7	7.8	9.9	7.9	8.8
		(3)	7.7	10.7	9.7	7.2	9.9	6.4	8.8
	2	(1)	8.0	6.2	5.4	7.0	2.5	4.2	6.2
		(2)	8.3	7.0	5.4	5.6	3.0	6.9	6.5
		(3)	8.3	5.8	5.4	6.2	3.0	9.4	6.5
	8	(1)	10.1	6.1	10.1	12.1	14.1	22.0	10.7
		(2)	10.8	6.7	10.5	13.2	13.8	23.2	11.1
		(3)	10.8	11.8	10.5	11.6	13.8	7.4	11.1
	4	(1)	15.5	11.6	5.9	10.1	5.8	7.5	10.5
		(2)	15.8	11.4	5.1	10.3	5.9	7.4	10.4
		(3)	15.8	10.5	5.1	9.7	5.9	11.8	10.4
	5	(1)	9.6	10.9	10.0	10.3	9.1	4.2	9.7
		(2)	9.2	10.2	8.5	8.9	10.3	5.9	9.1
		(3)	9.2	10.5	8.5	7.8	10.3	7.9	9.1
	6	(1)	8.0	8.4	5.6	6.2	7.1	4.2	7.0
		(2)	6.9	6.7	4.9	6.2	6.9	3.9	6.1
		(3)	6.9	5.6	4.9	7.4	6.9	4.9	6.1
	9	(1)	13.2	15.4	15.5	12.9	14.9	14.5	14.5
		(2)	13.4	14.4	15.5	15.5	13.3	9.8	14.2
		(3)	13.4	15.5	15.5	13.4	13.3	11.8	14.2
	11	(1)	5.3	6.5	6.0	4.1	4.2	5.4	5.4
		(2)	5.3	6.3	5.8	4.7	4.4	3.9	5.4
		(3)	5.3	4.4	5.8	6.2	4.4	6.4	5.4
	10	(1)	3.4	3.9	4.9	4.7	4.2	2.9	4.1
		(2)	3.4	4.2	5.1	4.5	4.9	3.4	4.2
		(3)	3.4	4.5	5.1	3.5	4.9	4.9	4.2
	7	(1)	5.4	6.2	5.2	5.9	6.2	2.1	5.5
		(2)	5.0	5.7	4.9	5.4	5.9	2.0	5.1
		(3)	5.0	3.9	4.9	6.6	5.9	4.9	5.1

level II and decreased 2.8% at level II and 1.7% at level IV. This is only one illustration of the complexities that must be dealt with in field research such as the present study. The first change reflects the fact that the elimination of DT and IO, for which during DARP data were inadequate or nonexistent, removed the two low-performing treatment groups from the total sample; the second change reflects further removal of low-performing subjects from the remaining treatment groups in order to perform analyses requiring complete during DARP data.

Comparison of MM, TC, and DF with Expectancy Including During DARP Performance

Sample conditions (1) and (2) in Tables 11 and 12 were required principally to indicate the changes in the data resulting from necessary restrictions of the sample in order to accomplish the analysis implied by condition (3), that is, computation of expected percentages based on the full prediction model involving four during DARP variables as well as nine pre DARP variables. Comparison of conditions (1) and (2) measures the effects of the elimination of the 224 patients with incomplete during DARP data, while comparison of (2) and (3) measures the effects of the addition of the four during DARP performance measures to prediction based on the nine pre DARP measures.

Careful reading of both tables indicates that there were no substantial changes in A values either by level or by outcome group from condition (1) to condition (2) (the A values for conditions (2) and (3) are identical by definition). Within the small range of changes indicated on A percentages, both TC and MM shifted toward more favorable actual outcome percentages and DF toward a slightly less favorable position. There were also a few changes in the E percentages from condition (1) to condition (2). In Table 11, the changes that were 2.0% in magnitude or greater were:

MM - Group 1 (14.4 to 17.5%)

TC - Group 9 (12.9 to 15.5%)

DF - Group 2 (4.2 to 6.9%), Group 9 (14.5 to 9.8%)

It is believed that the A and E (based on nine predictors) values presented in Table 9 are more representative than these in Table 12. However, the condition (2) values in Table 12 were the only available base for evaluation of the condition (3) values which reflected the expected percentages based on prediction augmented by the four during DARP predictors.

Changes in E percentages from sample condition (2) to condition (3) were intimated in the study by Neman et al. (1977) who reported that MDAs based on the 13 variables sharpened outcome prediction compared to results based on the nine pre DARP variables. The following tabulation shows E percentages for conditions (2) and (3) by treatment group by outcome group and outcome level (in parentheses):

Outcome Group	MM		TC		DF	
	(2)	(3)	(2)	(3)	(2)	(3)
1	17.5	16.8	18.8	20.4	25.6	24.1
3	9.8	10.7	7.8	7.2	7.9	6.4
2	7.0	5.8	5.6	6.2	6.9	9.4
	(34.3)	(33.3)	(32.2)	(33.8)	(40.4)	(39.9)
8	6.7	11.8	13.2	11.6	23.2	7.4
4	11.4	10.5	10.3	9.7	7.4	11.8
	(18.1)	(22.3)	(23.5)	(21.3)	(30.6)	(19.2)
5	10.2	10.5	8.9	7.8	5.9	7.9
6	6.7	5.6	6.2	7.4	3.9	4.9
9	14.4	15.5	15.5	13.4	9.8	11.8
	(31.3)	(31.6)	(30.6)	(28.6)	(19.6)	(24.6)
11	6.3	4.4	4.7	6.2	3.9	6.4
10	4.2	4.5	4.5	3.5	3.4	4.9
7	5.7	3.9	5.4	6.6	2.0	4.9
	(16.2)	(12.8)	(14.6)	(16.3)	(9.3)	(16.2)

As this tabulation shows, changes from (2) to (3) were comparatively small for MM and TC but substantial for DF. In MM only one outcome group shifted at least 2%; this was group 8 in which E increased from 6.7% to 11.8%; one of the TC groups, group 9, also shifted from 15.5% to 13.4% (a decrease of 2.1%). The figures for outcome level indicate that MM overall shifted to slightly more favorable expectations (Levels I and II increased by 3.2% and Levels III and IV decreased a similar amount) while TC showed a smaller net change. In DF, however, all of the unfavorable groups (Levels III and IV) showed increases -- overall, from 28.9% to 40.8%; there were modest increases in groups 2 (2.5%) and 4 (4.8%), but a decrease in group 8 of 15.8% (from 23.2% to 7.4%).

In comparing condition (2) results, based on nine predictors, with condition (3) results, based on 13 predictors, it should be noted that when the during DARP performance was consistent with prediction based on pre DARP variables, the condition (2) results were generally sharpened in condition (3). In some cases, however, during treatment performance in DARP was inconsistent with pre DARP status; some individuals with deviant backgrounds did well in DARP treatment and there were some with less deviant background who did poorly in treatment. Overall, during DARP performance was consistent with pre DARP prediction, but when it was not, the during DARP performance had greater weight.

The changes observed above are interpreted as follows: (1) When predictions were based on during DARP as well as pre DARP data (condition (3)), the expectations for MM became slightly more favorable than those based on pre DARP data only; for TC, they were about the same; and for DF they were considerably more unfavorable. (2) The more favorable expections for MM are believed to reflect the generally longer period of retention in treatment for a majority of MM patients (compared to TC and DF) as well as the high degree of compliance with social norms concerning drug use and criminality while in this treatment. The less favorable expectations for DF are believed to reflect the high early dropout

rate in DF and also the fact that DF treatment was generally less effective in the mixed sample of addicts and nonaddicts than the MM and TC treatments. The failure of TC to show improved expectations in condition (3) is believed also to reflect poor tenure, but offset by a more effective treatment process. Both Simpson et al. (1977) and Neman et al. (1977) have demonstrated that days in treatment is a strong predictor of outcome in all three treatments and this was confirmed by data in the present study. However, the present interpretation is based on average time in treatment for the three treatment groups and this does not conflict with the fact that patients who remained in DARP treatment longer had superior outcomes.

Comparison of A/T and (A-E)/T ratios for MM, TC, and DF in the Reduced Sample of 1403 (E based on 9 and 13 predictors)

The paired A/T and (A-E)/T ratios are shown, by outcome level in Table 13 and by outcome group, in Table 14. As is apparent in Table 13, both sets of ratios remained highly consistent in all three data sets shown (that is, sample condition (1) N = 1627, E based on nine predictors, condition (2) N = 1403 E based on nine predictors, and condition (3) N = 1403, E based on 13 predictors). MM excelled the other treatments at level II, as found earlier, and TC had the most favorable results at level I, particularly in respect to the excess of A over E. DF compared unfavorably with MM and TC, particularly in respect to the (A-E)/T ratios. The more detailed results in Table 14 require further discussion.

Outcome group 1, it will be recalled, was favorable on all criteria. As shown below (and in Table 12), it included 24.7% of the TC patients in the reduced sample of 1403 Black and White males, 21.7% of DF, and 14.3% of MM.

Table 13. A/T and (A-E)/T Ratios for MM, TC, and DF at 4 Outcome Levels Under 3 Conditions: (1) N=1627, E based on 9 predictors; (2) N=1403, E based on 9 predictors; (3) N=1403, E based on 13 predictors.

	Sample/ Condition	MM		TC		DF	
		A/T	(A-E)/T	A/T	(A-E)/T	A/T	(A-E)/T
Outcome Level I	(1)	.89	-.05	1.11	+.09	1.04	-.09
	(2)	.88	-.12	1.15	+.22	1.00	-.17
	(3)	.88	-.09	1.15	+.17	1.00	-.15
Outcome Level II	(1)	1.21	+.37	.75	-.30	.94	-.45
	(2)	1.24	+.40	.74	-.37	.92	-.51
	(3)	1.24	+.20	.74	-.27	.92	+.02
Outcome Level III	(1)	1.00	-.13	1.01	+.06	1.01	+.27
	(2)	1.00	-.06	.98	-.06	1.04	+.37
	(3)	1.00	-.07	.98	+.01	1.04	+.20
Outcome Level IV	(1)	.94	-.17	1.07	+.09	.97	+.28
	(2)	.93	-.17	1.07	+.08	1.03	+.40
	(3)	.93	+.06	1.07	-.03	1.03	-.07

Table 14. A/T and (A-E)/T Ratios for MM, TC, and DF for 11 Outcome Groups Under 3 Conditions: (1) N=1627, E based on 9 predictors; (2) N=1403, E based on 9 predictors; (3) N=1403, E based on 13 predictors.

	Sample/ Condition	MM		TC		DF	
		A/T	(A-E)/T	A/T	(A-E)/T	A/T	(A-E)/T
Outcome Group 1	(1)	.75	-.07	1.26	+.21	1.16	-.33
	(2)	.74	-.17	1.29	+.31	1.13	-.20
	(3)	.74	-.13	1.29	+.22	1.13	-.13
3	(1)	.90	-.24	1.03	+.11	1.26	+.49
	(2)	.88	-.24	1.10	+.22	1.13	+.23
	(3)	.88	-.34	1.10	+.28	1.13	+.40
2	(1)	1.29	+.29	.87	-.26	.40	-.27
	(2)	1.28	+.20	.83	-.03	.46	-.60
	(3)	1.28	+.38	.83	-.12	.46	-.98
Outcome Group 8	(1)	.94	+.37	.93	-.20	1.32	-.74
	(2)	.97	+.37	.95	-.24	1.24	-.85
	(3)	.97	-.09	.95	-.10	1.24	+.58
4	(1)	1.48	+.37	.56	-.40	.55	-.16
	(2)	1.52	+.42	.49	-.50	.57	-.14
	(3)	1.52	+.51	.49	-.44	.57	-.57
Outcome Group 5	(1)	1.00	-.13	1.03	-.03	.94	+.51
	(2)	1.01	-.11	.93	-.04	1.13	+.48
	(3)	1.01	-.14	.93	+.08	1.13	+.26
6	(1)	1.14	-.06	.80	-.09	1.01	+.41
	(2)	1.13	+.03	.80	-.21	1.13	+.49
	(3)	1.13	+.21	.80	-.41	1.13	+.33
9	(1)	.92	-.15	1.08	+.18	1.04	+.03
	(2)	.94	-.08	1.09	0	.94	+.25
	(3)	.94	-.15	1.09	+.15	.94	+.11
Outcome Group 11	(1)	.98	-.22	1.11	+.35	.78	-.22
	(2)	.98	-.19	1.07	+.20	.81	+.09
	(3)	.98	+.17	1.07	-.07	.81	-.37
10	(1)	.83	-.12	1.20	+.05	1.02	+.32
	(2)	.81	-.19	1.21	+.14	1.17	+.36
	(3)	.81	-.26	1.21	+.38	1.17	0
7	(1)	.98	-.15	.95	-.13	1.13	+.76
	(2)	.98	-.14	.96	-.10	1.16	+.76
	(3)	.98	+.22	.96	-.33	1.16	+.20

Group 1		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T=19.2%	MM	14.3	17.5	16.8	.74	-.17	-.13
	TC	24.7	18.8	20.4	1.29	+.31	+.22
	DF	21.7	25.6	24.1	1.13	-.20	-.13

These percentages, in relation to the total sample percentage (T) of 19.2%, resulted in A/T ratios of 1.29, 1.13, and .74, respectively, for TC, DF, and MM. In condition (2) the E percentage was highest for DF, reflecting the most favorable expectation for this treatment, based on pre DARP patient characteristics, and lowest for MM, with TC closer to MM than DF. As a result the (A-E)/T ratio in condition (2) was high and positive for TC (+.31) and negative for both MM and DF. However, the A/T ratio for MM was below par and this was reversed for DF. The paired ratios for TC indicated highly favorable outcomes for this treatment in group 1. Condition (3) involving E based on 13 predictors caused a slight decrease in E for MM, a small decrease for DF, but an increase in E for TC. These changes were small in all three treatments and TC still showed the most favorable results in outcome group 1.

Outcome Group 3 was also highly favorable except for relatively high unemployment. It accounted for approximately 10% of the TC and DF samples and 8% of MM. A summary of relevant data for group 3 is as follows:

Group 3		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (2)
T=8.8	MM	7.7	9.8	10.7	.88	-.24	-.34
	TC	9.7	7.8	7.2	1.10	+.22	+.28
	DF	9.9	7.9	6.4	1.13	+.23	+.40

In group 3, the expected percentage increased for MM from (2) to (3) while it dropped for DF and also for TC. As a result the (A-E)/T ratios, which are

positive for DF and TC in condition (2), increased for both in condition (3), especially DF. Thus it appears that the outcome pattern of group 3 was most frequent and beyond expectation in DF, in which there was the highest percentage of youth in the patient sample (and to a somewhat lesser extent in TC).

Outcome Group 2. This outcome groups was also favorable on five of the six profile variables; the one unfavorable element was return to treatment, a feature most characteristic of MM. The summary data were as follows:

Group 2		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T = 6.5%	MM	8.3	7.0	5.8	1.28	+.20	+.38
	TC	5.4	5.6	6.2	.83	-.03	-.12
	DF	3.0	6.9	9.4	.46	-.60	-.98

The results bear out the observation that the group 2 profile favors MM and was uncharacteristic of the two drug-free treatments, especially DF, in which return to treatment was apparently incompatible with other indicators of successful performance after DARP. It can be seen in the summary tabulation that the differences in relation to expected percentages became sharper in condition (3), where the (A-E)/T ratios become more extreme in all these treatments.

Outcome Group 8. The outcome profile of group 8 involved abstinence from opioids but some continued indulgence in nonopioids and this was observed to be a characteristic of the youthful DF sample although a considerable number of MM and TC patients in this outcome group gave up opioids after DARP and apparently turned to nonopioids in the post DARP period. A summary of the data for group 8 is shown, as follows:

Group 8		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T=11.1%	MM	10.8	6.7	11.8	.97	+.37	-.09
	TC	10.5	13.2	11.6	.95	-.24	-.10
	DF	13.8	23.2	7.4	1.24	-.85	+.58

As observed previously, the DF sample had the highest A percentage in group 8. The E percentage for MM increased from condition (2) to condition (3) indicating an increased expectation of a shift from opioid to nonopioid use and this resulted in a drop of the (A-E)/T ratio from +.37 to -.09. TC was in between MM and DF in expectancy and incurred a small drop in E from (2) to (3) with a resulting drop in the (A-E)/T ratio. The most dramatic change in group 8 was the drop in E for DF from 23.2% in condition (2) to 7.4% in condition (3), with a corresponding increase in (A-E)/T -.85 to +.58. These results suggest that the group 8 pattern was not only more popular in DF than in the other treatments, but that it occurred almost twice as frequently as would be expected, based on full model (13 variables) prediction. Group 8 was classified as moderately favorable because of low mean scores on opioid use and criminality, but might well be regarded as a problem profile for youth whose records at admission to treatment showed neither addiction nor criminality; there were many in this category in DF.

Group 4. This group, classified as moderately favorable, had zero post DARP criminality, but all patients in group 4 returned to treatment; it was also characterized by some degree of unemployment and opioid use. As observed previously, this was considered a likely "good" outcome profile for many MM patients even though it was placed in level II in the present outcome scale. The summary data for group 4 support this view, as shown below:

Group 4		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T=10.4%	MM	15.8	11.4	10.5	1.52	+.42	+.51
	TC	5.1	10.3	9.7	.49	-.50	-.44
	DF	5.9	7.4	11.8	.57	-.14	-.57

As expected, the percentage (A) of MM patients in group 4 was nearly three times as great as the comparable percentages of TC and DF patients. Further, this exceeded predicted expectancy with (A-E)/T ratios of +.42 (2) and +.51 (3).

Group 5. The profile of group 5 was classified as moderately unfavorable, but it was associated more with opioid addicts than with nonaddict drug users because of zero or near zero means on nonopioid use and alcohol use (see Table 3). The outcome summary was as follows:

Group 5		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T=9.1%	MM	9.2	10.2	10.5	1.01	-.11	-.14
	TC	8.5	8.9	7.8	.93	-.04	-.08
	DF	10.3	5.9	7.9	1.13	+.48	-.26

Actually, there were proportionately fewer MM patients in group 5 than there were DF patients, but the expected percentages were higher for MM than for TC or DF. The paired A/T and (A-E)/T ratios indicate that the at par frequency for MM was below expectation and therefore a favorable outcome, while that for DF was unfavorable by virtue of an above par frequency which was considerably below expectation. The TC results were within expected limits.

Group 6. The profile for group 6 is similar to that for group 5, except that group 6 was higher on opioid use and lower on criminality than group 5 and also slightly lower on the percentage that returned to treatment (see Table 3). The summary for group 6 follows:

Group 6		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T=6.1%	MM	6.9	6.7	5.6	1.13	+.03	+.21
	TC	4.9	6.2	7.4	.80	-.21	-.41
	DF	6.9	3.9	4.9	1.13	+.49	+.33

The actual percentages (A) for group 6 were identical for MM and DF (6.9%) and lower for TC (4.9%). As shown in the right-hand column, (A-E)/T (3), these reflected an excess over expectancy for both MM and DF, indicating a higher percentage of unfavorable outcomes of this type than expected, and the opposite for TC.

Group 9. This group, with moderate deviance on most of the profile variables, represented the most common unfavorable profile in the total sample; it was second only to group 1 and 4 in frequency in MM and to group 1 in TC and DF. The summary data were as follows:

Group 9		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T=14.2%	MM	13.4	14.4	15.5	.94	-.08	-.15
	TC	15.5	15.5	13.4	1.09	0	+.15
	DF	13.3	9.8	11.8	.94	+.25	+.11

TC had the highest percentage in this group, and also exceeded expectation in condition (3), where (A-E)/T was +.15. The lower frequency of MM (13.4%) was also lower than expected, indicating favorableness of outcome; the A/T ratio for DF was within the "average" range, but also considerably above expectation, indicating an unfavorable outcome for DF.

Group 11. The profile for group 11 indicated moderate to heavy drug use, both opioid and nonopioid, but not high criminality. This was a small group with a total frequency of 5.4%, as shown in the tabulation below. This group, along with groups 10 and 7, comprising the unfavorable level (IV), had total frequencies around 5% and the ratios based on them were considered unstable; as a result, they are not interpreted. The summaries for groups 10 and 7 are nevertheless included, as follows; profile descriptions are included in Table 3.

Group 11		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T=5.4%	MM	5.3	6.3	4.4	.98	-.19	+.17
	TC	5.8	4.7	6.2	1.07	+.20	-.07
	DF	4.4	3.9	6.4	.81	+.09	-.37
Group 10		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T=4.2%	MM	3.4	4.2	4.5	.81	-.19	-.26
	TC	5.1	4.5	3.5	1.21	+.14	+.38
	DF	4.9	3.4	4.9	1.17	+.36	0
Group 7		A (2) & (3)	E (2)	E (3)	A/T (2) & (3)	(A-E)/T (2)	(A-E)/T (3)
T=5.1%	MM	5.0	5.7	3.9	.98	-.14	+.22
	TC	4.9	5.4	6.6	.96	-.10	-.33
	DF	5.9	2.0	4.9	1.16	+.76	+.20

Summary. The combined frequencies (A) for outcome levels I and II were approximately the same for MM (57%), TC (55%), and DF (55%) in the reduced sample of 1403 Black and White males. However, TC was highest (40%) in level I, with DF second (35%) and MM last (30%). MM was highest in level II (27%), with DF second (20%) and TC last (15%). No remarkable differences were found in levels III and IV. Review of the (A-E)/T ratios showed that expected values shifted from sample condition (2), based on nine predictors, to condition (3), based on 13 predictors, but did not alter the general conclusions concerning the questionable status of DF, compared to MM and TC. Review of the results by outcome groups revealed that in the favorable range TC excelled the other treatments in group 1, MM in groups 2 and 4, and DF in groups 3 and 8. In the unfavorable range, however, DF exceeded expectancy mainly in groups 6, 9, and 7 and was below expectancy in groups 5 and 11. These differences were tied

to drug use patterns and suggested that the DF results in particular were affected by the nonaddict component of the DF group. Inasmuch as the sample of 1403 included both addicts and nonaddicts, a further analysis was carried out for these subsamples of the three treatments. This is reported in the next section.

Comparison of Outcomes for Addicts and Nonaddicts in MM, TC, and DF

The reduced sample of 1403 Black and White males included 1001 patients who were daily opioid users during the two-month baseline period, classified as current addicts; 277 who had a history of former daily opioid use, but were not using daily during the baseline period, who were classified as former addicts; and 125 who had never used opioids daily, who were classified as nonaddicts. These were divided among the three treatments as follows:

	MM	TC	DF	Total
Current addicts	582	326	93	1001
Former addicts	102	120	55	277
Nonaddicts	1	69	55	125
	685	515	203	1403

The 102 MM patients classified as former addicts were reported on their DARP admission forms as not having used opioids daily during the two-month baseline period, immediately prior to admission. However, other data in their admission histories indicated that they had been daily opioid users prior to that time and presumably they were all considered eligible for methadone maintenance. Some of these patients were transfers to DARP treatment from other treatment programs or institutions; others may have transferred from correctional institutions. In any case they were analyzed as former addicts in MM. The one MM patient classified as a nonaddict may have been misreported.

The outcome results for current addicts, former addicts, and nonaddicts are shown in Table 15 by outcome level and in Table 16 by outcome group. Since the numbers of patients in the three DF subgroups and in the TC nonaddict subgroup were very small, these results are presented tentatively and are subject to cross-validation in the Cohort 3 sample, for which data collection began during April, 1978.

Comparison of overall results (T) in the two samples. The overall results for former addicts were more favorable than those for current addicts (all treatments combined) and those for the nonaddict group were considerably more favorable than those for the two addict groups. This is expressed by the following percentages from Table 15 which combine T values for levels I and II versus those for levels III and IV for the three groups:

	Current Addicts	Former Addicts	Nonaddicts
Percentage at Levels I + II	51.2	65.3	72.8
Percentage at Levels III + IV	48.8	34.7	27.2

Despite the magnitude of the differences between the three patient groups on these T percentages, there were substantial outcome differences among the three patient groups by treatment modality. These can be observed by reference to Tables 15 and 16 and are discussed below. In these tables MM is not represented in the nonaddict subsample.

Comparison of patient subsamples within DARP MM. In general, the MM results in Tables 15 and 16 are similar to those reported earlier for MM in the total sample of 1923 Black and White males (Tables 8 and 9). The MM data for the total sample (Table 8) and for current and former addicts (Table 15) are summarized below by outcome level, with the E and (A-E)/T ratios for sample condition (2), where E was based on 9 pre DARP variables.

Table 15. A and E percentages and A/T and (A-E)/T ratios for 1001 current addicts, 277 former addicts, and 125 nonaddicts in the Black and White male sample in MM, TC, and DF treatment groups, by outcome level. (Reduced sample, N=1403) E(2) based on 9 pre DARP variables; E(3) based on 9 pre DARP variables + 4 during DARP variables.

Treatment Group	Outcome Level	T	MM A	MM E(2) E(3)	MM A/T	MM (A-E)/T(2) (A-E)/T(3)	TC A	TC E(2) E(3)	TC A/T	TC (A-E)/T(2) (A-E)/T(3)	DF A	DF E(2) E(3)	DF A/T	DF (A-E)/T(2) (A-E)/T(3)
Current Addicts (N=1001)	I	30.5	29.2	32.5	.96	-.11	35.6	25.5	1.17	.33	21.6	36.6	.71	-.49
				30.4		-.04		27.0		.26		15.1		.21
	II	20.7	25.1	16.5	1.24	.42	13.9	17.5	.67	-.10	17.2	16.2	.83	.05
				21.4		.18		20.2		-.30		15.1		.10
	III	32.4	31.2	32.8	.96	-.05	32.2	36.3	.99	-.13	40.8	29.0	1.26	.36
				33.7		-.08		31.9		.01		38.7		.06
	IV	16.4	14.7	18.1	.90	-.21	18.3	20.8	1.12	-.15	20.4	18.3	1.24	.13
				14.3		.02		20.8		-.15		31.5		-.68
			N=582				N=326				N=93			
Former Addicts (N=277)	I	44.0	36.3	45.1	.83	-.20	51.7	42.5	1.18	.22	41.8	56.4	.95	-.33
				50.0		-.31		40.0		.27		51.0		-.21
	II	21.3	35.3	26.4	1.66	.42	14.1	22.5	.66	-.39	10.9	21.8	.51	-.51
				26.5		.41		24.9		-.51		27.3		-.78
	III	22.8	20.6	23.5	.90	-.13	22.5	30.0	.99	-.33	27.2	18.2	1.19	.39
				20.6		0		24.9		-.11		14.6		.55
	IV	11.9	7.9	5.0	.66	.24	11.7	5.1	.98	.55	20.0	3.6	1.68	1.38
				3.0		.42		9.9		.15		7.2		1.08
			N=102				N=120				N=55			
Nonaddicts (N=125)	I	44.0					39.2	47.9	.89	-.20	49.2	31.0	1.12	.44
								55.1		-.36		71.0		-.50
	II	28.8					26.1	46.4	.91	-.70	32.7	63.6	1.14	-1.07
								20.3		.20		18.2		.50
	III	20.8					24.7	4.4	1.19	.98	16.4	5.5	.79	.52
								18.8		.28		10.9		.26
	IV	6.4					10.2	1.5	1.59	1.36	1.8	0	.28	.28
								5.8		.68		0		.28
			N=1				N=69				N=55			

Table 16. A and E percentages and A/T and (A-E)/T ratios for 1001 current addicts, 277 former addicts, and 125 nonaddicts in the Black and White male sample in MM, TC, and DF treatment groups, by outcome group. (Reduced sample, N=1403). E(2) based on 9 pre DARP variables; E(3) based on 9 pre DARP + 4 during DARP variables.

Outcome Group	Y	MM (N=582) A	E (2)	E (3)	A/T	(A-E)/T(2)	(A-E)/T(3)	TC (N=326) A	E (2)	E (3)	A/T	(A-E)/T(2)	(A-E)/T(3)	DF (N=93) A	E (2)	E (3)	A/T	(A-E)/T(2)	(A-E)/T(3)
Current Addicts	(N=1001)																		
1	16.3	13.9	15.3	14.6	.85	-.09	-.04	22.1	11.4	13.8	1.36	.66	.51	10.8	20.4	5.4	.66	-.59	.33
3	7.4	7.4	10.5	10.3	1.00	-.42	-.39	8.0	8.3	6.4	1.08	-.04	.22	5.4	9.7	4.3	.73	-.58	.15
2	6.9	7.9	6.7	5.5	1.18	.17	.35	5.5	5.8	6.8	.80	-.04	-.19	5.4	6.5	5.4	.78	-.16	0
8	9.0	10.3	3.6	11.3	1.14	.74	-.11	7.1	3.1	10.7	.79	.44	-.40	7.5	1.1	5.4	.83	.71	.23
4	11.7	14.8	12.9	10.1	1.26	.17	.40	6.8	14.4	9.5	.58	-.65	-.23	9.7	15.1	9.7	.83	-.46	0
5	10.7	10.0	11.0	11.5	.93	-.09	-.14	10.4	12.0	9.5	.97	-.15	.08	16.1	11.8	16.1	1.50	.40	0
6	6.7	7.4	7.2	5.7	1.09	.03	.25	5.2	7.7	8.3	.76	-.37	-.46	8.6	5.4	5.4	1.26	.48	.48
9	14.9	13.8	14.6	16.5	.93	-.05	-.18	16.6	16.6	14.1	1.11	0	.17	16.1	11.8	17.2	1.08	.29	-.07
11	5.4	5.0	7.0	4.6	.93	-.37	.07	6.4	6.4	6.4	1.19	0	0	4.3	7.5	12.9	.80	-.59	-1.59
10	5.1	4.0	4.6	5.3	.78	-.12	-.25	6.1	6.4	5.2	1.20	-.06	.18	8.6	6.5	10.0	1.69	.41	-.27
7	5.9	5.7	6.5	4.5	.97	-.14	.20	5.8	8.0	9.2	.98	-.37	-.58	7.5	4.3	8.6	1.27	.54	-.19
Former Addicts	(N=277)																		
1	26.4	16.7	30.4	29.4	.63	-.52	-.48	34.2	26.7	28.3	1.30	.28	.22	27.3	34.6	25.5	1.03	-.28	.07
3	10.8	8.8	5.9	12.8	.81	.27	-.37	11.7	8.3	7.5	1.08	.31	.39	12.7	12.7	14.6	1.18	0	-.18
2	6.8	10.8	8.8	7.8	1.59	.29	.44	5.8	7.5	4.2	.85	-.25	.24	1.8	9.1	10.9	.26	-1.07	-1.34
8	11.6	13.7	23.5	13.7	1.18	-.84	0	10.8	18.3	12.5	.93	-.65	-.15	9.1	20.0	5.5	.78	-.94	.31
4	9.8	21.6	2.9	12.8	2.20	1.19	.90	3.3	4.2	12.5	.34	-.09	-.94	1.8	1.8	21.8	.18	0	-2.04
5	5.4	4.9	5.9	4.9	.91	-.19	0	6.7	5.0	5.8	1.24	.31	.17	3.6	1.8	1.8	.67	.33	.33
6	6.2	3.9	3.9	5.9	.63	0	-.32	5.8	5.8	5.8	.94	0	0	10.9	5.5	7.3	1.76	.87	.58
9	11.2	11.8	13.7	9.8	1.05	-.17	.18	10.0	19.2	13.3	.89	-.82	-.29	12.7	10.9	5.5	1.13	.15	.64
11	6.1	6.9	2.0	2.0	1.13	.80	.80	5.0	1.7	5.8	.82	.54	-.13	7.3	1.8	1.8	1.20	.90	.90
10	1.4	0	2.0	0	0	-1.43	0	1.7	1.7	.8	1.21	0	.64	3.6	1.8	1.8	2.57	1.29	1.29
7	4.3	1.0	1.0	1.0	.23	0	0	5.0	1.7	3.3	1.16	.77	.40	9.1	0	3.6	2.12	2.12	1.28
Nonaddicts	(N=125)	MM (not included)																	
1	26.4							20.3	40.6	37.7	.77	-.77	-.66	34.6	25.5	54.6	1.31	.34	-.76
3	15.2							14.5	4.4	10.1	.95	.67	.29	14.6	0	1.8	.96	.96	.84
2	2.4							4.4	2.9	7.3	1.83	.63	-1.21	0	5.5	14.6	0	-2.29	-6.08
8	27.2							26.1	44.9	14.5	.96	-.69	.06	29.1	63.6	12.7	1.07	-1.27	.61
4	1.6							0	1.5	5.8	0	-.94	-3.69	3.6	0	5.5	.23	2.25	-1.19
5	4.8							2.9	1.5	2.9	.60	.29	0	7.3	0	0	1.52	1.52	1.52
6	.8							1.5	0	5.8	1.88	1.88	-5.38	0	0	1.8	0	0	-2.25
9	15.2							20.3	2.9	10.1	1.34	1.14	.67	9.1	5.5	9.1	.60	.24	0
11	3.2							4.4	1.5	5.8	1.38	.91	-.44	1.8	0	0	.56	.56	.56
10	3.2							5.8	0	0	1.81	1.81	1.81	0	0	0	0	0	0
7	0							0	0	0	0	0	0	0	0	0	0	0	0

MM Summary		T	A	E	A/T	(A-E)/T
All patients (Table 8) N=773	Level I	31.1	29.5	26.6	.95	+.09
	II	20.3	25.6	17.0	1.26	+.42
	III	32.2	30.8	37.6	.96	-.21
	IV	16.4	14.1	19.0	.86	-.30
Current addicts (Table 15) N=582	Level I	30.5	29.2	32.5	.96	-.11
	II	20.7	25.1	16.5	1.24	+.42
	III	32.4	31.2	32.8	.96	-.05
	IV	16.4	14.7	18.1	.90	-.21
Former addicts (Table 15) N=102	Level I	44.0	36.3	45.1	.83	-.20
	II	21.3	35.3	26.4	1.66	+.42
	III	22.8	20.6	23.5	.90	-.13
	IV	11.9	7.9	5.0	.66	+.24

Despite the striking similarity of outcomes for the three subsamples, they nevertheless reflect two noteworthy differences. The first is that the outcomes for former addicts were substantially more favorable than those for current addicts, from whom they are distinguished on the basis of status at admission to DARP treatment. The second is that the results for all patients are clarified by the breakdown by current and former addicts. Since current addicts in the present sample outnumbered former addicts by almost 6 to 1, the current addict results were most similar to those for the total sample. Nevertheless, although former addicts in all treatments had more favorable outcomes percentagewise than current addicts, as reflected in the T values above, they had relatively fewer of their number (lower A/T ratios) in level I outcome groups and relatively more in level II groups, compared to current addicts. They also had relatively fewer in level III and especially level IV outcome groups. The results for former addicts conform more closely to the MM sterotype, mentioned earlier, which regards abstinence (reflected by level I profiles) as unrealistic for confirmed addicts and favors continuation in maintenance treatment. The level II profiles, involving generally favorable outcomes on criminality, but moderate drug use, are considered more relevant for MM patients. Indeed, group 4 (level II) is the only outcome

group in the Favorable and Moderately Favorable range with a profile that conforms with this stereotype and the A/T ratios for group 4 (Table 16) were 1.26 for current addicts, compared to 2.20 for former addicts. In addition, for outcome group 2 (level I), which was similar to group 4 in respect to one hundred percent returned to treatment after DARP (but was abstinent as well), the A/T ratio was 1.18 for current addicts and 1.59 for former addicts. The former addicts in DARP MM included both transfers from other treatment programs and former MM patients who returned to treatment after unsuccessful detoxification. For them there was a high rate of favorable outcome if, as suggested by the stereotype, level II outcomes can be accepted as favorable.

Comparison of patient subsamples within DARP TC. In the present sample there were 326 current addicts, 120 former addicts, and 69 nonaddicts in TC. The results for both addict subsamples, as those reported earlier for all patients combined, were well above par for level I, below par for level II, and not different from par for levels III and IV, but the results for the nonaddict subsample were quite unfavorable, as summarized below:

TC Summary			T	A	E	A/T	(A-E)/T
All patients (Table 8)	Level	I	31.1	36.9	34.4	1.19	+.08
N=613		II	20.3	15.9	19.8	.78	-.19
		III	32.2	31.1	29.4	.97	+.05
		IV	16.4	16.1	16.5	.98	-.02
Current addicts	Level	I	30.5	35.6	25.5	1.17	+.33
(Table 15)		II	20.7	13.9	17.5	.67	-.10
N=326		III	32.4	32.2	36.3	.99	-.13
		IV	16.4	18.3	20.8	1.02	-.15
Former addicts	Level	I	44.0	51.7	42.5	1.18	+.22
(Table 15		II	21.3	14.1	22.5	.66	-.39
N=120		III	22.8	22.5	30.0	.99	-.33
		IV	11.9	11.7	5.1	.98	+.55
Nonaddicts (Table 15)	Level	I	44.0	39.2	47.9	.89	-.20
N=69		II	28.8	26.1	46.4	.91	-.70
		III	20.8	24.7	4.4	1.19	+.98
		IV	6.4	10.2	1.5	1.59	+1.36

As shown in the summary tabulation, the A/T ratios for all patients and for both the current and former addict subsamples were closely similar. However, removal of the nonaddicts (as well as 98 patients eliminated earlier for missing criterion data) resulted in higher (A-E)/T ratios for level I. The results by outcome level thus indicate that approximately 36% (116) of the current addicts in DARP TC and 52% (62) of the former addicts in TC (those who had apparently detoxified successfully) were in the three highly favorable outcome groups and that these exceeded the numbers expected on the basis of pre DARP patient characteristics. At the same time, both TC addict subsamples were well below par and below expectation in level II in which some drug use was characteristic. In the Unfavorable range (levels III and IV) the two addict subsamples were both close to par. Overall, then, the TC outcomes for addicts were favorable primarily because they exceeded par and expectation in level I.

Although the TC nonaddict subsample was small (N=69) the results clearly indicated unfavorable results. This group was below par and below expectation at both Favorable levels and the opposite at both Unfavorable levels. It is quite probable that the nonaddicts in TC were atypical in relation to the predominant patient complement, compared to whom they were younger and less involved in opioid use and that for reasons related to this status difference they felt estranged and did more poorly during treatment and subsequently. If this should prove correct it would suggest that their failure would be attributed more to their relations with the other residents and less to the treatment process per se.

Comparison of patient subsamples within DARP DF. At the inception of the DARP in 1969 federal support was available only for narcotic addicts. This restriction prevailed throughout the period of Cohort 1 admission (June

1969 through May 1971) but was subsequently relaxed when new legislation opened federally supported treatment to other drug users as well. There is undoubtedly a relationship between the admission of nonaddicts to federally supported treatment and the presence of DF programs. There were no DF patients in the Cohort 1 followup sample and the numbers in the present study were only 241 in the total sample (Tables 8 and 9) and 203 in the reduced sample (Tables 15 and 16), divided into 93 current addicts and 55 each in the former addict and nonaddict subsamples. Although these subsamples are very small, the results, which are opposite to those for TC in respect to outcomes for addicts and nonaddicts, are clear and easily interpreted. They are summarized as follows:

DF Summary		T	A	E	A/T	(A-E)/T
All patients (Table 8)	Level I	31.1	34.4	33.7	1.11	+.02
N=241	II	20.3	19.9	29.8	.98	-.49
	III	32.2	31.1	27.8	.97	+.10
	IV	16.4	14.6	8.7	.89	+.36
Current addicts	Level I	30.5	21.6	36.6	.71	-.49
(Table 15)	II	20.7	17.2	16.2	.83	+.05
N=93	III	32.4	40.8	29.0	1.26	+.36
	IV	16.4	20.4	18.3	1.24	+.13
Former addicts	Level I	44.0	41.8	56.4	.95	-.33
(Table 15)	II	21.3	10.9	21.8	.51	-.51
N=55	III	22.8	27.2	18.2	1.19	+.39
	IV	11.9	20.0	3.6	1.68	+1.38
Nonaddicts (Table 15)	Level I	44.0	49.2	31.0	1.12	+.44
N=55	II	28.8	42.7	63.6	1.14	-1.07
	III	20.8	16.4	5.5	.79	+.52
	IV	6.4	1.8	0	.28	+.28

The results for all patients, from Table 8, are shown above to represent a combination of data for subsamples with unlike outcomes. The excess over par for A/T at level I is seen only among the nonaddicts, but this was both below par and below expection in both addict subsamples. In general, the two

addict subsamples in DF experienced unfavorable post DARP outcomes while the nonaddicts in DF had highly favorable outcomes. As shown in detail in Table 16, for current addicts and former addicts this picture is clear for almost every outcome group; for nonaddicts, the favorable outcomes are seen mainly in the above par A/T ratios in outcome groups 1 and 8 and in the below par A/T ratios in groups 6, 9, 11, 10, and 7.

Comparison of MM, TC, and DF outcomes for current addicts. Comparisons of outcomes across treatments are more appropriate by outcome group, using the data in Table 16 than by outcome level (Table 15) which was used in the comparisons within treatment groups. For current addicts, the relevant data are shown in the upper panel of Table 16. Because of the small numbers of patients in many of the groups, the expected percentages (E) and the ratios (A-E)/T must be viewed cautiously. In most instances in Table 16 they appear interpretable and the transition from condition (2), based on 9 pre DARP predictors, to condition (3) based on these plus four during DARP measures, reflects the effects of the during-treatment measures. However, the implications of these measures cannot be analyzed in detail until data become available on additional cases in the Cohort 3 samples for which field work is currently in progress. A brief summary of the outcome group results for current addicts follows; + and - signs are used to distinguish favorable and unfavorable results; when neither a + or - is appropriate, no comment is made.

MM	Favorable range (Groups 1, 3, 2)	+ Significant favorable results in Group 2 - Below par frequency in Group 1
	Mod. Favorable range (Groups 8, 4)	+ Significant favorable results in Groups 8 and 4

MM (continued)

	Mod. Unfav. range (Groups 5, 6, 9)	+ Below par frequency in	Groups 5 and 9
		- Above par frequency in	Group 6
	Unfavorable range (Groups 11, 10, 7)	+ Significant favorable results in	Group 10
		+ Below par frequency in	Group 11
TC	Favorable range (Groups 1, 3, 2)	+ Significant favorable results in	Group 1
		- Below par frequency in	Group 2
	Mod. Favorable range (Groups 8, 4)	- Significantly below par in	Group 4
		- Below par frequency in	Group 8
	Mod. Unfav. range (Groups 5, 6, 9)	+ Significant favorable results in	Group 6
		- Above par frequency in	Group 9
	Unfavorable range (Groups 11, 10, 7)	- Above par frequency in	Groups 11 and 10
DF	Favorable range (Groups 1, 3, 2)	- Significant unfavorable results in	Groups 1, 3, 2
	Mod. Favorable range (Groups 8, 4)	- Significant unfavorable results in	Group 4
		- Below par frequency in	Group 8
	Mod. Unfav. range (Groups 5, 6, 9)	- Significant unfavorable results in	Groups 5 and 6 (nearly so in 9)
	Unfavorable range (Groups 11, 10, 7)	- Significant unfavorable results in	Groups 10 and 7
		+ Significant favorable results in	Group 11

From this summary it appears first that the DF results were generally unfavorable for current addicts, while those for MM were generally favorable. The outcome results for TC were mixed, but noteworthy primarily because of the high frequency (22.1%), well beyond expectation, in group 1, the most favorable group. Indeed, TC was the only treatment above par in group 1. TC also showed favorable results in group 6, which is characterized by moderate to heavy opioid use and some criminality, but in the remaining groups, the results were either negative (groups 3, 8, 4, 9, 11, 10) or not different from par.

In general, current addicts who did well in TC (level I) were those who could detoxify and continue on an abstinent basis after leaving treatment. These accounted for 35.6% of the TC current addict sample. An additional 13.9% of the current addicts in TC were in level II groups, which involved moderate to light nonopioid use (group 8) or opioid use(group 4), but zero or low criminality. By most TC standards, this group might not be judged successful, but by many MM standards, they would be considered to have done reasonably well. Thus in the following summary, TC exceeded MM at level I; MM exceeded TC at level II; and MM exceeded TC at levels I and II combined. The interpretation of these results in terms of absolute performance depends on the value commitments of the decider.

	MM		TC		DF		
	A Percent	A/T Ratio	A Percent	A/T Ratio	A Percent	A/T Ratio	T Percent
Level I	29.2	.96	35.6	1.17	21.6	.71	30.5
Level II	25.1	1.24	13.9	.67	17.2	.83	20.7
Levels I + II	54.3	1.06	49.5	.97	38.8	.76	51.2

As noted above, the DF treatment was contraindicated for current addicts by these results.

Comparison of MM, TC, and DF outcomes for former addicts. The former addicts in DARP treatment represent a carefully defined group who were not daily opioid users at admission although they had been daily users previously. Many of these entered DARP programs from other treatment programs; some came from jails or prisons where narcotics were generally not available and others presumably had attempted detoxification unsuccessfully. This group had a better overall prognosis in DARP treatments as shown by their T values, compared to those for current addicts:

	T Percents	
	Current Addicts	Former Addicts
Level I	30.5	44.0
Level II	30.7	21.3
Level III	32.4	22.8
Level IV	16.4	11.9

This better prognosis probably reflects the effects of prior treatments, efforts to detoxify, and improved status at admission to DARP treatment and is supported by the higher E percentages for former addicts than for current addicts as shown in Tables 15 and 16.

A brief summary of the outcome group results for the former addict subsample is presented as follows, based on the data in the middle panel of Table 16:

MM	Favorable range (Groups 1, 3, 2)	+ Significant favorable results in - Below par frequency in	Group 2 Groups 1 and 3
	Mod. Favorable range (Groups 8, 4)	+ Significant favorable results in + Above par frequency in	Group 4 Group 8
	Mod. Unfav. range (Groups 5, 6, 9)	+ Below par frequency in	Groups 5 and 6
	Unfavorable range (Groups 11, 10, 7)	+ Below par frequency in - Significant unfavorable results in	Groups 10 and 7 Group 11
TC	Favorable range (Groups 1, 3, 2)	+ Significant favorable results in + Above par frequency in - Significant unfavorable results in	Group 1 Group 3 Group 2
	Mod. Favorable range (Groups 8, 4)	- Below par frequency in	Groups 8 and 4
	Mod. Unfav. range (Groups 5, 6, 9)	+ Significant favorable results in - Significant unfavorable results in	Group 9 Group 5
	Unfavorable range (Groups 11, 10, 7)	+ Below par frequency in - Above par frequency in	Group 11 Groups 10 and 7

DF	Favorable range (Groups 1, 3, 2)	+ Above par frequency in - Significant unfavorable results in	Group 3 Group 2
	Mod. Favorable range (Groups 8, 4)	- Significant unfavorable results in - Below par frequency in	Group 8 Group 4
	Mod. Unfav. range (Groups 5, 6, 9)	- Significant unfavorable results in + Below par frequency in	Groups 6 and 9 Group 5
	Unfavorable range (Groups 11, 10, 7)	- Significant unfavorable results in	Groups 11, 10 and 7

The results and conclusions for former addicts are, apart from the differences in A percentages, essentially the same as for current addicts. The DF results were generally unfavorable; those for MM were generally favorable, particularly in respect to the excess above par and expectation at level II; and those for TC were distinguished mainly at level I. To the extent that former addicts include patients who show evidence of rehabilitation but inability to detoxify, the MM treatment is indicated as the most appropriate assignment. For those who are able to live in an abstinent state, either MM or TC may be indicated. As in the current addict sample, the DF treatment is contraindicated for former addicts who are returned to treatment.

Comparisons of MM, TC, and DF outcomes for nonaddicts. Nonaddicts were defined arbitrarily as users of illicit drugs who had never used opioids daily at the time of DARP admission and they included some who had used opioids as well as nonopioids, but not daily, and also users of nonopioids only. The small sample size argued against further partition of the samples. This subsample was represented in TC and DF; they were not eligible for MM treatment. Since they included only nonopioid users and polydrug users they tended to be younger and to have had less criminality at admission; on the counts of drug use and criminality they were less deviant on the major dimensions of the criteria then either of the two addict groups. The former addict subsample gained in favorable prognosis over the current addicts because of more

favorable baseline measures and the nonaddicts had even more favorable background and baseline measures than the former addicts, although this may have been reduced somewhat in condition (3) as a result of the low tenure and high "quit" rate in DF.

A brief summary of the results for the nonaddict outcome groups in TC and DF, based on the lower panel of Table 16, is as follows:

TC	Favorable range (Groups 1, 3, 2)	+ Significant favorable outcomes in - Significant unfavorable outcomes in	Group 2 Group 1
	Mod. Favorable range (Groups 8, 4)	- Significant unfavorable outcomes in	Group 4
	Mod. Unfav. range (Groups 5, 6, 9)	- Significant unfavorable outcomes in + Below par frequency in	Groups 6 and 9 Group 5
	Unfavorable range (Groups 11, 10, 7)	- Significant unfavorable outcomes in + Below par (zero) frequency in	Groups 11 and 10 Group 7
DF	Favorable range (Groups 1, 3, 2)	+ Significant favorable outcomes in - Significant unfavorable outcomes in	Group 1 Group 2
	Mod. Favorable range (Groups 8, 4)	- Below par frequency in	Group 4
	Mod. Unfav. range (Groups 5, 6, 9)	- Significant unfavorable outcomes in + Below par frequency in	Group 5 Groups 6 and 9
	Unfavorable range (Groups 11, 10, 7)	+ Below par frequency in	Groups 11, 10 and 7

Overall, these results were unfavorable in TC and favorable in DF. In TC, the high frequency in Group 1, above expectation, found in both addict subsamples, changed to below par for nonaddicts, and in the two unfavorable levels, TC was well above par and above expectation in four groups (6, 9, 11, and 10); in addition, there were no nonaddicts in group 7, either in TC or DF. The two groups in which TC outcomes were favorable (group 2, with 4.4% and group 5, with 2.9% of the TC nonaddict subsample) were small. In DF, there were no

nonaddicts in groups 10 or 7 and the frequencies of the remaining unfavorable range (levels III and IV) groups were below par except in group 5, where the results were opposite to those in TC. In addition, the DF nonaddicts were well above par and above expectation in group 1, where the A/T ratio was 1.31.

Summary of results for the addict and nonaddict subsamples. The results presented in Tables 15 and 16 and discussed in the preceding sections suggest that MM and TC have been effective in DARP for opioid addicts and DF for nonaddicts. Nonaddicts are precluded from admission to MM programs; they were included in TC programs and their outcomes were generally unfavorable. Both current and former addicts were included in DF programs and their results, too, were unfavorable.

The distinction between current and former addicts was made in the course of the analysis of these data on an *a posteriori* basis, using data obtained on the DARP admission record in the intake process. It was noted that the former addicts had more favorable baseline scores than the current addicts and both more favorable expectations (E percentages) and more favorable outcomes. The former addicts in MM had higher A/T ratios than current addicts in outcome groups 2 and 8, indicating a greater proportion who had returned to maintenance treatment, probably as a result of inability to detoxify, and also lower proportions in outcome groups 6, 10, and 7, in the unfavorable outcome range. At the same time, a substantial percentage of former addicts in DARP TC was found in outcome groups 1 and 3, who were abstinent (or nearly so) for three years after DARP treatment. These results suggest that continuation in maintenance treatment may well be indicated for addicts who are unable to detoxify and that this factor should favor MM over TC treatment assignment when a choice is possible. The former addicts in TC who had favorable outcomes after DARP must have been successfully detoxified.

Of course, all treatment groups had some of their patients in the favorable (abstinent) outcome groups of level I; the preceding discussion was concerned with comparative frequencies, evaluated in relation to expectation. The absolute percentages (A) and their corresponding A/T ratios are summarized in Table 17 for ease of reference.

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1 OF 2

Table 17. Summary of A percentages and A/T ratios for current and former addicts and nonaddicts in DARP MM, TC, and DF. Reduced sample (N=1403).

	Outcome Group	MM		TC			DF		
		Current Addicts	Former Addicts	Current Addicts	Former Addicts	Non-addicts	Current Addicts	Former Addicts	Non-addicts
A Percentages	1	13.9	16.7	22.1	34.2	20.3	10.8	27.3	34.6
	3	7.4	8.8	8.0	11.7	14.5	5.4	12.7	14.6
	2	7.9	10.8	5.5	5.8	4.4	5.4	1.8	0
	8	10.3	13.7	7.1	10.8	26.1	7.5	9.1	29.1
	4	14.8	21.6	6.8	3.3	0	9.7	1.8	3.6
	5	10.0	4.9	10.4	6.7	2.9	16.1	3.6	7.3
	6	7.4	3.9	5.2	5.8	1.5	8.6	10.9	0
	9	13.8	11.8	16.6	10.0	20.3	16.1	12.7	9.1
	11	5.0	6.9	6.4	5.0	4.4	4.3	7.3	1.8
	10	4.0	0	6.1	1.7	5.8	8.6	3.6	0
	7	5.7	1.0	5.8	5.0	0	7.5	9.1	0
A/T Ratios	1	.85	.63	1.36	1.30	.77	.66	1.03	1.31
	3	1.00	.81	1.08	1.08	.95	.73	1.18	.96
	2	1.18	1.59	.80	.85	1.83	.78	.26	0
	8	1.14	1.18	.79	.93	.96	.83	.78	1.07
	4	1.26	2.20	.58	.34	0	.83	.18	.23
	5	.93	.91	.97	1.24	.60	1.50	.67	1.52
	6	1.09	.63	.76	.94	1.88	1.26	1.76	0
	9	.93	1.05	1.11	.89	1.34	1.08	1.13	.60
	11	.93	1.13	1.19	.82	1.38	.80	1.20	.56
	10	.78	0	1.20	1.21	1.81	1.69	2.57	0
	7	.97	.23	.98	1.16	0	1.27	2.12	0
	N	582	102	326	120	69	93	55	55

Chapter 6

EFFECTIVENESS ASSESSMENT AND CONCLUSIONS

The analyses reported in this study involved comparison of post DARP outcomes of four treatment modalities (MM, TC, DF, and DT) and a DARP no-treatment comparison group (IO) included in the DARP Cohort 1-2 followup sample. These analyses were based on Black and White males, the only groups included in all five treatment samples.

Chapter 4 presented comparisons of the five treatment groups in terms of percentages found in 11 post DARP outcome groups that represented distinct outcome profiles and were arrayed on a scale of favorableness of outcome. These comparisons were aided by the computation of expected percentages that were designed to take into account, as far as possible, variations in prognosis for favorable outcome based on the pre DARP and during DARP characteristics and performance of patients in the respective treatment followup samples. Estimation of expectancy was based on weights for nine pre DARP variables that were disclosed by multiple discriminant analysis, as explained in Chapter 3. Only pre DARP predictors could be included in this five-group comparison since during DARP data were incomplete for the short-term DT group and unavailable for the IO group.

The results of this study provided strong positive evidence for the effectiveness of MM and TC treatment and strong negative evidence questioning the effectiveness of DT treatment, as well as unfavorable outcomes for the IO sample. The results for DF were in between MM and TC on the positive side and DT and IO on the negative side, but closer to MM and TC. In view of the fact that DF included addicts as well as nonaddicts and there were indications that these subsamples may have fared differently, further analyses were undertaken to compare them, as reported in Chapter 5.

The two major analyses reported in Chapter 5 involved (a) comparison of MM, TC, and DF, using expectancy percentages based on the nine pre DARP variables and also these plus four during DARP variables for which significant predictive weights had been obtained, and (b) comparison of current addicts (daily opioid users at DARP admission), former addicts (not daily opioid users at admission but with a history of prior daily use), and nonaddicts (all others, consisting of less-than-daily users of opioids and users of nonopioids only with no history of daily opioid use). These analyses were restricted to the three major modalities for two reasons. First, as explained earlier, during DARP data were inadequate or not available for DT and IO, and second, the sample sizes of DT and IO were too small to permit meaningful analysis of their subsamples. Indeed, the subsamples of MM, TC, and DF were marginal, in several instances, for the analyses undertaken.

The analyses in Chapter 5 could not be compared directly with those in Chapter 4 because the exclusion of DT and IO and also of 224 patients in MM, TC, and DF who had missing during DARP data changed the sample significantly. This is explained in detail in Chapter 5 and had the effect of eliminating a portion of the "low end" of the total sample. The final samples were considered suitable for the comparisons undertaken, but the data in Chapter 4 are believed to be more appropriate for generalization of the effectiveness results.

The inclusion of during DARP predictors had a number of significant effects on expected percentages that were noted in detail in Chapter 5. However, the general results obtained in Chapter 4 were not materially altered. The comparison of both current and former addicts with nonaddicts confirmed, the expectation that DF treatment was not effective for addicts and indicated a superior level of effectiveness for nonaddicts in DARP DF. A surprising result was that nonaddicts did very poorly in TC. Overall, the results for

MM would be rated best in both addict subsamples, if level II outcomes were accepted along with level I as favorable. However, even if this were not accepted, the superiority of TC for addicts was apparent only in the surplus of patients in the first two outcome groups (1 and 3). In view of the many problems that have been noted as relevant in interpretation of the results obtained, it appears most appropriate to conclude that MM and TC were found to be effective treatments for addicts (both current and former) and not nonaddicts and that DF was effective nonaddicts, but not for addicts.

A major problem was encountered in this study as a result of the decision to use the same criteria to compare outcomes of the different treatments. This was the result of two circumstances: first, differences in pre DARP status of the patient populations found in MM, TC, and DF treatment, which have been discussed in detail in the preceding text, and second, differences in program philosophy and goals, that impact differentially on the criteria. However, the general goals of the research required that the total DARP system be addressed and this could best be accomplished with a uniform profile of behavior--based on criteria that were ordered according to a scale of overall favorableness of outcome. The development of discrete outcome groups and the ranking of the outcome groups in terms of overall favorableness of outcome was of major importance in this research because it enabled gross judgments of treatment effectiveness on the basis of proven criteria while at the same time it enabled examination of percentage variations in different outcome groups (with different characteristic profiles) that contribute to the understanding of the results.

The problem referred to is well illustrated by one of the criterion profile variables (T, return to treatment) which was scored negatively (that is, as an unfavorable outcome) in the present study. Despite the fact that

return to treatment has been advocated by leaders in MM treatment (e.g., Dole and Joseph, 1977) and is probably justified for those long-term opioid addicts in MM who appear unable to detoxify, there can be little basis for considering return to treatment as a positive outcome of treatment. It may be necessary when detoxification is impossible, but it still represents a failure of treatment, as Savage and Simpson (1977) and Simpson and Savage (1978) have clearly shown. True, return to treatment has been considered here as only one of six variables defining the criterion profile. For example, outcome group 2, for which the profile is defined by high employment, abstinence from opioids and nonopioids, zero criminality, and 100% return to treatment, is classified in level I, among the three most favorable groups, while group 7, unfavorable on all measures, also involves 100% return to treatment. Although both involve return to treatment, their positions on the favorableness of outcome scale are determined by their scores on the other measures in the profile. The final criterion composite reflects scores computed on the basis of drug use (opioids and nonopioids), employment, criminality, alcohol use, and return to treatment. On a scale of 0 (most favorable) to 100 (most unfavorable), the four outcome levels had the following mean scores, rounded to whole numbers:

Level I	Groups 1, 3, 2	Favorable outcomes	8
Level II	Groups 8, 4	Moderately favorable outcomes	20
Level III	Groups 5, 6, 9	Moderately unfavorable outcomes	39
Level IV	Groups 11, 10, 7	Unfavorable outcomes	64

The overall assessment of treatment effectiveness, based on the data presented in this study, is believed to be reflected best by Table 8 which includes the five treatment groups in the followup study. For these data expectancy values were necessarily based only on pre DARP predictors. The

data reflect the actual and expected percentages of each treatment group at each level and enable estimation of outcome effectiveness based on adjustment for the differences between actual and expected percentages. Although the estimation of expected percentages does not adjust fully for sample differences and the samples are not representative of the general population of drug users in treatment, the data are considered useful to assess outcome effectiveness, although not for calculation of effectiveness rates. Unfortunately the sample sizes were too small to permit decomposition of Table 8 into results for current and former addicts and nonaddicts. Hence the Table 8 results should be interpreted in conjunction with those presented in Table 15.

As shown in Table 8, the gross results (A percentages) for MM, TC, and DF were highly favorable, with between 55% (MM) and 53% (TC) of their patients at level I or II. By contrast, DT and IO fell considerably behind, with 35% (DT) and 37% (IO) in the favorable range.

MM fell slightly behind TC and DF at level I, but still had 29.5% of its patients at this favorable level. This was slightly below par but slightly greater than expectation. At level II, however, the 25.6% of MM patients was both well above par and well above expectation; in addition, MM was the only treatment group with positive results for level II. In the unfavorable range, MM was well below par at level IV and well below expectation at both level III and level IV. Overall, MM must be considered a successful treatment, but the estimation of effectiveness rates requires that a value judgment be made concerning the inclusion of level II in the favorable outcome range.

TC had the highest percentage at level I (36.9%), which was also well above expectation. At level II, however, TC was below par and below expectation while at levels III and IV the results were not discriminably below par. The high percentage at level I in particular qualifies TC as a successful treatment.

DF was also above MM at level I, but the other indications for DF in Table 8 were not favorable. The 34.4% at level I was almost exactly as expected for this treatment group which included a substantial number of nonopioid users, while the 19.9% at level II was well below expectation and the 31.1% at level III and the 14.6% at level IV were both above expectation. Questions were raised in Chapter 4 concerning the overall effectiveness of DF, which was represented in DARP by a mixed sample of addicts and nonaddicts. As shown in Chapter 5, when these subsamples were considered separately, DF was shown to be ineffective for the two addict groups addressed, but functioned at a highly favorable level for the nonaddict group.

DT and IO. The results for DT and IO must be regarded as evidence that DT is not an effective treatment while the patients included in the IO group showed that they had not received treatment in DARP. In view of the short time-span of DT treatment, it is believed that a primary function of DT should be to recruit patients for more extended treatment.

Conclusion. The computation of specific effectiveness rates for the treatments included in this study was considered and it was concluded that the data available were not appropriate as a basis for such rates. Issues of sampling and the relatively small size of the samples followed have been discussed in this regard. Nevertheless the data analyzed do support the general conclusion that treatment of drug users in the DARP, in the MM, TC, and DF modalities, was highly successful. MM and TC were found to be effective for opioid addicts but not for nonaddicts and DF, for nonaddicts but not addicts. MM was contraindicated for nonaddicts by virtue of its chemotherapeutic specificity. DT could not be considered as a viable treatment on the basis of the followup study results.

REFERENCES

Cole, Steven G. and Watterson, Olive. A treatment typology for drug abuse in the DARP: 1971-1972 admissions. August, 1974, IBR Report No. 74-16. In S.B. Sells and D.D. Simpson (Eds.) Effectiveness of drug abuse treatment (Vol. 3). Further studies of drug users treatment typologies and assessment of outcomes during treatment in the DARP. Cambridge, Mass.: Ballinger, 1976.

Cushman, P., Jr. Detoxification of rehabilitated methadone patients: frequency and predictors of long-term success. American Journal of Drug & Alcohol Abuse, 1974, 1, 393-408.

Dole, V.P. & Joseph, J. The long-term outcome of patients treated with methadone maintenance. New York Academy of Sciences, Conference on Recent Developments in Chemotherapy of Narcotic Addiction, Washington, D.D., 1977.

Hornick, Christopher W., Demaree, R.G., Sells, S.B., and Neman, Janice F., Measurement of post-DARP outcomes: The definition of a composite and differential outcome groups. National followup study of admissions to drug abuse treatments in the DARP during 1969-1972. IBR Report No. 77-17.

James, Lawrence, R., Watterson, O., Bruni, John, and Cole, Steven, G. Studies on the development and validation of checklists for classification of drug abuse treatment programs. December, 1975, IBR Report No. 75-19. In S.B. Sells and D.D. Simpson (Eds.) Effectiveness of drug abuse treatment (Vol. 5). Evaluation of treatment outcomes for the 1972-1973 admission cohort. Cambridge, Mass.: Ballinger, 1976.

Joe, George W., Singh, B.K., Finklea, D., Hudiburg, R., and Sells, S.B. The effects of racial and ethnic compositions of treatment programs on treatment outcomes. February, 1977, IBR Report No. 77-7. Reprinted by the National Institute on Drug Abuse, Services Research Report DHEW Publications No. (ADM) 78-573, 1978.

Neman, Janice F., Demaree, R.G., Hornick, Christopher W., and Sells, S.B. Client characteristics and other variables associated with differential post DARP outcome groups. December, 1977, IBR Report No. 77-16.

Robins, L.N. The Vietnam drug user returns: Final report. St. Louis, Missouri: Washington University School of Medicine, Department of Psychiatry, 1973.

Robins, L.N., Davis, D.J., & Nurco, D.N. How permanent was Vietnam drug addiction? American Journal of Public Health Supplement, 1974, 64, 38-43.

Sells, S.B. (Ed.) Studies of the effectiveness of treatment for drug abuse (Vol. 1). Evaluation of treatments. Cambridge, Mass.: Ballinger, 1974 a.

Sells, S.B. (Ed.) Studies of the effectiveness of treatment for drug abuse (Vol. 2). Research on patients, treatments, and outcomes. Cambridge, Mass.: Ballinger, 1974 b.

Sells, S.B. Treatment effectiveness. To appear in: R.L. DuPont, A. Goldstein, and J.A. O'Donnell (Eds.) Handbook on drug abuse. Washington, D.C.: U.S. Government Printing Office, 1978, in press.

Sells, S.B., Demaree, Robert G., Simpson, D.Dwayne, Joe, George W., and Gorsuch, Richard L. Issues in the evaluation of drug abuse treatment. Professional Psychology, November 1977, 609-640.

Sells, S.B. and Simpson, D.D. (Eds.) Effectiveness of drug abuse treatment (Vol. 3). Further studies of drug users treatment typologies and assessment of outcome during treatment in the DARP. Cambridge, Mass.: Ballinger, 1976 a.

Sells, S.B. and Simpson, D.D. (Eds.) Effectiveness of drug abuse treatment (Vol. 4). Evaluation of treatment outcomes for the 1971-1972 admission cohort. Cambridge, Mass.: Ballinger, 1976 b.

Sells, S.B. and Simpson, D.D. (Eds.) Effectiveness of drug abuse treatment (Vol. 5). Evaluation of treatment outcomes for the 1972-1973 admission cohort. Cambridge, Mass.: Ballinger, 1976 c.

Sells, S.B. and Simpson, D.D. Evaluation of treatment for youth in the Drug Reporting Program (DARP). April, 1977, IBR Report No. 77-9.

Senay, E.C., Dorus, W., Goldberg, F., & Thornton, W. Withdrawal from methadone maintenance and expectation. Archives of General Psychiatry, 1977, 34, 361-367.

Simpson, D.D. and Joe, G.W. Sample design and data collection. National followup study of admissions to drug abuse treatment in the DARP during 1969-1972. March, 1977, IBR Report No. 77-8.

Simpson, D. Dwayne and Savage, L. James, Outcomes and return to treatment during a three year followup. National followup study of admissions to drug abuse treatments in the DARP during 1969-1972. March, 1978, IBR Report No. 78-2.

Simpson, D. Dwayne, Savage, L. James, Lloyd, Michael R., and Sells, S.B. Evaluation of drug abuse treatments based on the first year after DARP. National followup study of admissions to drug abuse treatments in the DARP during 1969-1972. September, 1977, IBR Report No. 77-14.

Singh, B.K. The effects of community structure on aggregated during-treatment outcomes of methadone matinenance programs in the DARP. April, 1977, IBR Report No. 77-10.

Stimmel, B., Goldberg, J., Rotkopf, E., & Cohen, M. Ability to remain abstinent after methadone detoxification. A six-year study. Journal of the American Medical Association, 1977, 237, 1216-1220.

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