

Methadone Treatment and Legal Supervision: Individual and Joint Effects on the Behavior of Narcotics Addicts

M. DOUGLAS ANGLIN

KEIKO I. POWERS

University of California, Los Angeles

This study investigated the individual and joint effects of methadone maintenance treatment and of legal supervision that included drug use testing (e.g., parole or probation) in improving the behaviors of narcotics addicts. Subjects were 202 clients selected from a sample of admissions to methadone clinics in southern California. The subjects selected had experienced all intervention conditions (methadone maintenance alone, legal supervision/drug testing alone, both interventions simultaneously, and neither intervention) in their addiction careers. Extensive interviewing of subjects provided longitudinal self-report data on various characteristics and behaviors. Repeated measures analysis of variance was used to test for statistical differences. Overall, the individual effect of methadone maintenance and of legal supervision was better than that of the no-intervention condition in improving drug use and criminal behavior by narcotics addicts. Methadone maintenance alone showed a broader range of improvement (e.g., in employment) and greater magnitude of improvement than did legal supervision alone. The combined effect of these two intervention conditions was not significantly better than that of methadone maintenance alone, except on abstinence from narcotics use.

Social interventions to solve behavioral problems related to drug abuse derive predominantly from two major approaches: those involving treatment services and those imposed by the criminal justice system (CJS). Research studies have assessed the

Data analysis and preparation of this article were supported in part by Grant 88-IJ-CX-0036 from the National Institute of Justice and Grants DA05544, DA04268, and DA06250 from the National Institute on Drug Abuse. Dr. Anglin is also supported by a Research Scientist Development Award (DA00146-01) from the National Institute on Drug Abuse. Further support was obtained from California Department of Alcohol and Drug Programs Contract D-0004-10.

JOURNAL OF APPLIED BEHAVIORAL SCIENCE, Vol. 27 No. 4, December 1991 515-531
© 1991 NTL Institute

effectiveness of each of these approaches in controlling chronic narcotics use and associated antisocial behavior. Many studies have evaluated the effectiveness of methadone maintenance treatment services in particular; most such studies have shown that methadone maintenance is effective in controlling narcotics use and associated criminal involvement. By contrast, studies of the effectiveness of CJS-imposed legal supervision in achieving these same aims have shown mixed results. Although some evaluation studies of legal supervision have reported favorable outcomes, other such studies have indicated that legal supervision is, at most, modestly effective in controlling behaviors related to narcotics use.

Although evaluation studies have investigated the effectiveness either of treatment or of legal supervision individually, the joint effectiveness of these two intervention approaches has not been studied to the same extent. This empirical study examines the combined effectiveness of methadone maintenance and legal supervision (restricted here to legal supervision involving urine testing for drug use) by comparing the observed behavioral patterns of narcotics addicts under both methadone maintenance and legal supervision to those patterns observed under only one such intervention. The behavioral patterns observed under all three intervention conditions are contrasted to the behavioral patterns demonstrated when addicts are under neither intervention.

The data for the present study were longitudinal retrospective self-reports obtained from extensive interviews with narcotics addicts in southern California. The data obtained were aggregated across each addict's addiction career to identify various behavioral patterns under each of the four conditions stated above. Intervention effectiveness among these conditions was compared for selected behavioral variables—including narcotics use, other drug use, property crime, drug dealing, employment, and marital status. It was hypothesized that narcotics addicts would show the most improvement in their behaviors when under both legal supervision (with drug testing) and methadone maintenance. Methadone maintenance alone was expected to produce less behavioral improvement than the combined condition but more than legal supervision alone. Finally, legal supervision alone was expected to produce more improvement in behavior than the condition under which the addicts were subject neither to legal supervision nor to methadone maintenance. Repeated measures analysis of variance (ANOVA) was used to test for statistical differences in behaviors among these four conditions.

BACKGROUND

Many studies have evaluated the effectiveness of methadone maintenance in reducing narcotics use and associated criminal activities. Several review papers have assessed the evaluation literature on methadone maintenance treatment (Anglin & Hser, 1990;

M. Douglas Anglin, Ph.D., is the director of the UCLA Drug Abuse Research Center, Los Angeles, CA.

Keiko I. Powers, Ph.D., is currently an assistant research psychologist at the UCLA Drug Abuse Research Center, Los Angeles, CA.

Bowden & Maddux, 1972; Liappas, Jenner, & Vicente, 1988; Maddux & Bowden, 1972; Peck & Beckett, 1976; Senay, 1985). Some of these reviews are critical of the conclusion, reported in many evaluation studies, that methadone maintenance is effective in improving addict behaviors; these reviews note methodological flaws and researchers' bias toward favorable outcomes. In the aggregate, however, the various empirical studies have produced overwhelming evidence that methadone maintenance actually is effective in reducing narcotics use and associated crime. These studies uniformly report reductions in drug use and in criminal activity among addicts, following the introduction of methadone maintenance (Dupont, 1972; Gearing, 1974; Hser, Anglin, & Chou, 1988; Hubbard et al., 1983; McGlothlin, 1976; McGlothlin & Anglin, 1981; Sells & Simpson, 1980; Simpson & Sells, 1983).

In particular, Hser et al. (1988) used repeated measures ANOVA to compare the behaviors of narcotics addicts between pretreatment, during-treatment, and posttreatment conditions. Their study showed that drug use and criminality were reduced significantly during treatment and that prosocial behaviors such as employment were increased. However, unless treatment was of long duration, problematic behaviors often recurred after treatment discharge, even though not to the same magnitude as pretreatment levels.

Empirical studies focusing on the "pure" effect of criminal justice system (CJS) interventions on narcotics addiction have been less common than methadone maintenance studies. Furthermore, the evaluation outcomes of such studies are equivocal and generally less impressive than those for methadone maintenance. Among CJS evaluation studies, many have focused on the effectiveness of civil commitment programs for narcotics addiction. For example, the California Civil Addict Program (CAP), initiated in 1961 and administered by the California Department of Corrections, had two phases over a 7-year commitment period: incarceration and then parole, or monitored release, into the community. Follow-up studies of CAP conducted by McGlothlin and his colleagues reported favorable outcomes (Anglin & McGlothlin, 1984; McGlothlin, 1976; McGlothlin, Anglin, & Wilson, 1977). These authors concluded that CAP had an important effect on suppressing daily narcotics use and property crime. More recently, a special issue of the *Journal of Drug Issues* reviewed civil commitment programs implemented in several jurisdictions and summarized evidence that showed only some of these commitment programs, notably the California CAP and certain federal Narcotic Addict Rehabilitation Act (NARA) programs, achieved favorable results (see Anglin, 1988).

Some studies suggest that the observed variation in the effectiveness of CJS interventions results from the particular types of legal supervision offered. It has been claimed that legal supervision with objective drug testing and sanctions for detected use is the most effective CJS approach for controlling narcotics use and property crime. By contrast, legal supervision without drug testing has been found to be little better than no supervision (Anglin, Deschenes, & Speckart, 1987; Deschenes, Anglin, & Speckart, 1990). To the extent that these findings exemplify the effect of different specific conditions on outcomes, it is possible that previous studies have shown few effects for legal supervision because of the way such legal supervision was defined and measured.

With limited exceptions, research on the combined effect of CJS and community treatment has been restricted to studies of the effects of legal status (such as probation, parole, or pending judicial action) on treatment admission, subsequent treatment retention, and during- and posttreatment behaviors. Studies in this area have shown diverse results. Those studies not supporting any positive effect of legal status on treatment outcomes are based mostly on longitudinal data from the Drug Abuse Reporting Program (DARP). Sells and Simpson (1976a, 1976b, 1976c) and Simpson and Friend (1988) examined the relationship between contact with the CJS at admission and length of stay in treatment, as well as client performance during and after treatment. These studies found that those addicts entering treatment with some legal involvement performed as well as other admissions. However, they also showed that legal status itself was an insignificant contributor to retention, based on discriminant functions estimated separately for methadone maintenance, outpatient drug-free programs, and short-term therapeutic community programs. Anglin, Brecht, and Maddahian (1989) compared three groups of heroin addicts entering methadone maintenance under different legal coercion levels (high, moderate, and low) and found no significant difference in level of improvement for drug use or criminal behavior.

Studies that have shown a positive impact for CJS intervention found that legal pressure increased admission rates into treatment and may have promoted better retention in treatment, consequently improving the overall results of treatment. McFarlain, Cohen, Yoder, and Guidry (1977), for example, found that legal pressure increased early retention (i.e., the first 30 days after admission), although not long-term retention. Similarly, Schnoll, Goldstein, Antes, and Rinella (1980) found that legal pressure increased retention in an inpatient treatment program and that clients admitted immediately after release from prison were most likely to complete the program. Overall, the literature suggests that drug users identified by the legal system and coerced into treatment are likely to remain in treatment and to benefit from their participation as much as, or more than, those entering under more voluntary circumstances.

Previous studies examining the effects of legal supervision on the outcomes of drug abuse treatment have assessed one aspect of the interaction of the two social interventions (i.e., drug treatment and legal supervision). However, these studies did not investigate the relative contributions of these two interventions in the control of narcotics use and of associated crime. Furthermore, these studies mainly observed changes in narcotics-related behaviors; they did not investigate effects of interventions on more diverse life-style changes, such as employment, marital status, or other drug use. Although the primary goals of these interventions are to control narcotics use and reduce the incidence of associated crime, it is also important to see whether such social interventions facilitate other behavioral changes that allow narcotics addicts to become more productive citizens. In other words, it is necessary to examine many aspects of the behavior of narcotics addicts to better understand the impact of social interventions on that behavior. This study broadens the focus of previous studies by offering a multidimensional evaluation of drug abuse intervention.

METHOD

Sample

The data for the present study were obtained from extensive retrospective longitudinal interviews conducted between 1978 and 1981 with 999 heroin addicts who entered several methadone maintenance clinics in southern California. The sample subjects were White and Chicano, male and female.¹ More detailed descriptions of sample selection and sample characteristics were given in previous articles (Anglin, McGlothlin, Speckart, & Ryan, 1982; McGlothlin & Anglin, 1981). Of the original 999 subjects, only those reporting experiences under the three intervention conditions (i.e., methadone maintenance alone, legal supervision alone, and both methadone maintenance and legal supervision) and the no-intervention condition were retained for repeated measures ANOVA. Thus analyses were based on a qualified sample of 202. To examine differences and similarities between the selected sample and the excluded sample, the two samples were compared on various background characteristics. The comparison outcomes are discussed below. Note that these data on addiction patterns and consequences were obtained in a period just at the onset of the cocaine epidemic of the 1980s. Narcotics addicts and methadone maintenance clients have demonstrated increased cocaine use during the last decade, and such use has received attention and response both by treatment programs and by CJS supervision agents. In general, however, over the last decade, consumption patterns, consequences, and social intervention responses have not changed to a significant degree among primary narcotics users in southern California (Hser, Anglin, & Powers, 1991).

Interview Procedure

The interview procedure was adapted in part from one developed by Nurco and colleagues (Nurco, Bonito, Lerner, & Balter, 1975); this procedure has been described in detail in an earlier article (McGlothlin et al., 1977). Briefly, before the interview, a schematic time chart was prepared showing all official records of arrests, incarceration, legal status, and treatment. The interviewer established the date of first narcotic use on the time chart and then augmented the time chart with respondents' self-reports of other important life events suitable to assist in recall (e.g., births, moves, or employment). Starting from the time of first narcotics use, the interviewer recorded all time points when narcotics use changed from less-than-daily use to daily use, or vice versa, or when the respondent's legal supervision or treatment status changed. These time points were used to divide each respondent's addiction history into several intervals, which were uniform for narcotics use, legal status, and drug treatment enrollment. Self-report data on narcotics, alcohol, and other drug use; employment; drug dealing; criminal behavior; and certain other variables were then collected for each identified interval. In this way, the respondent's entire addiction history was recorded from a year before first narcotics use to the time of interview. This method of obtaining self-report information has been shown to yield data of high reliability (Hser, Anglin, & Chou, 1991).

Design of Analysis

Repeated measures ANOVA techniques were used to examine differences in intervention effectiveness among the four conditions during the addiction career. These conditions were treated as a within-subject factor and were defined as follows:

1. Neither condition: periods during which the addict was receiving no methadone maintenance and was under either no legal supervision or any legal supervision that occurred without drug testing
2. Legal supervision (LS)-only condition: periods during which the addict was under legal supervision (probation or parole) with drug testing but was receiving no methadone maintenance
3. Methadone maintenance (MM)-only condition: periods during which the addict was receiving methadone maintenance but was under either no legal supervision or any legal supervision that occurred without drug testing or had absconded from legal supervision
4. Both methadone maintenance and legal supervision (MM/LS) condition: the addict was receiving methadone maintenance and was under legal supervision with drug testing.

For the two conditions involving legal supervision, only legal supervision that included drug testing was taken into account. Previous studies have reported mixed outcomes for CJS effectiveness depending on the type of legal supervision and have indicated that legal supervision with objective testing is the most effective approach. Our analysis tested whether this type of legal supervision is in fact effective. In addition, the analysis excluded periods during which an addict had absconded from legal supervision because legal supervision was considered to be ineffective during these periods.

Several measures representing a broad behavioral perspective were included as dependent variables—for example, narcotics use, property crime, drug dealing, other drug use, marital status, and employment. These variables were measured using one or more of the following three units: (a) the percentage of nonincarcerated time involved in each activity, or percentage of time maintaining the status, during the interval (e.g., percentage of time using narcotics daily); (b) the number of incidences per interval (e.g., the number of days committing property crime); and (c) the amount of money obtained during the interval (e.g., income from employment).

To provide aggregate measures of these dependent variables for the four conditions, each subject's self-reported addiction history from first daily narcotics use to 1 year after last daily narcotics use² was examined with reference to the subject's participation in methadone maintenance and legal supervision with drug testing. Figure 1 illustrates how an individual addiction history can be segmented into several intervals representing the four different intervention conditions. Values for each dependent variable were summed across all segments representing the same condition to derive aggregate values. Finally, average values for each subject were computed by dividing these aggregate values by the total number of months for each condition. For example, if the number of crimes committed during the first, second, and third MM-only

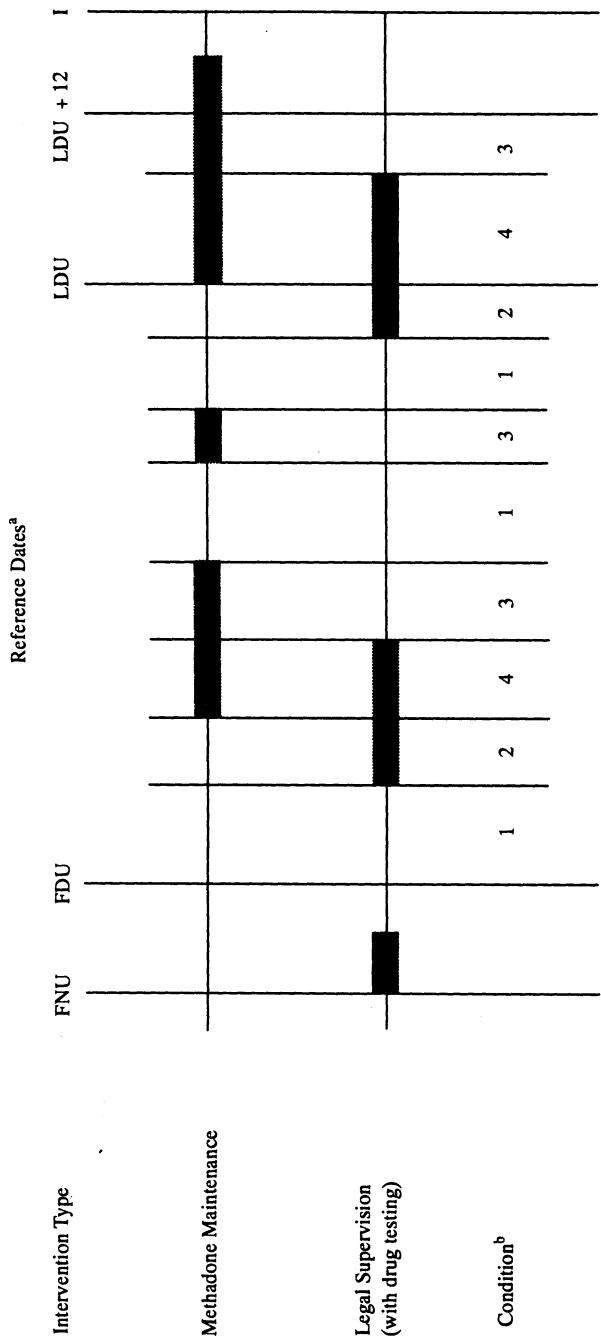


FIGURE 1: A Typical Addiction Career, Illustrating the Four Treatment Conditions

NOTE: On the above figure, shaded parts of lines indicate that a subject was in a methadone maintenance program or under legal supervision with testing.

a. Reference dates: FNU = first narcotics use; FDU = last daily use of narcotics (start of addiction career); LDU = last daily use of narcotics; LDU + 12 = 12 months after LDU (end of addiction career); I = interview.

b. Condition: 1 = neither legal supervision with testing nor methadone maintenance; 2 = legal supervision with testing only; 3 = methadone maintenance only; 4 = both legal supervision with testing and methadone maintenance.

TABLE 1
Treatment Conditions and Narcotics Use: Aggregate Duration
for Each Addiction Career (from FDU to LDU + 12)^a (*n* = 202)

<i>Intervention Type</i>	<i>No. Nonincarcerated Months (A)^b</i>	<i>No. Months Daily Use (B)</i>	<i>% Time Daily Use (B/A × 100)</i>
Neither	10,646 (44.9)	8,051	75.6
Legal supervision ^c	4,578 (19.3)	2,616	57.1
Methadone maintenance	4,313 (18.2)	994	23.0
Methadone maintenance and legal supervision ^c	4,187 (17.6)	878	21.0
Total	23,724 (100.0)	12,539	52.9

a. FDU = first daily use of narcotics; LDU = last daily use of narcotics.

b. Percentages shown in parentheses.

c. Legal supervision with drug testing.

conditions was 15, 4, and 7, respectively, then the aggregate value would be the sum of these, or 26. The next step would obtain the total number of months under methadone maintenance. Assume this total is 60 + 15 + 9 = 84 months for the three MM conditions in this example. Then the average value for the number of crimes for the MM-only condition for this subject would be 26/84 = 0.3. These average values were used for the repeated measures ANOVA analyses.

Table 1 summarizes the aggregate addiction career data for all qualified sample members. It presents the aggregate duration (in months) of each treatment condition, for each of the four conditions. These data indicate that many addicts were using narcotics daily when not under formal social control, that is, when receiving neither methadone maintenance nor legal supervision. Implications of this finding will be discussed later.

FINDINGS

Background Characteristics

The subjects selected for repeated measures ANOVA were those addicts who had experienced all four treatment conditions at some point in their addiction histories. To better understand the nature of this analysis sample (*n* = 202), a summary of various background characteristics of the selected and the excluded (*n* = 797) samples was prepared, and statistical comparisons were made between the two groups (see Table 2).

The results of chi-square and *t* tests between the analysis and the excluded samples indicated the following. The analysis sample contained more males and more Chicanos than did the excluded sample. Furthermore, the mean values for the selected subjects were lower for age at first daily use and age at first arrest and higher for age at interview and length of the addiction career. However, remaining factors (e.g., family background, occupation, and mean ages at first narcotics use and at first entry to methadone maintenance) showed very similar results between the two samples.

TABLE 2
**Background Characteristics: Analysis Sample
 and Excluded Sample (percentages in parentheses)**

<i>Characteristics</i>	<i>Analysis Sample (n = 202)</i>	<i>Excluded Sample (n = 797)</i>	χ^2/t^a
Demographic			
Gender			*
Male	149 (74)	522 (66)	
Female	53 (26)	275 (34)	
Ethnicity			*
Chicano	83 (41)	263 (33)	
White	119 (59)	534 (67)	
Main occupation at time of interview			
Unskilled	70 (35)	249 (31)	
Semiskilled/skilled	132 (65)	548 (69)	
Mean highest school grade	10.7	10.9	
Family background			
Family SES^b			
Poor/working class	87 (43)	355 (45)	
Middle/upper-middle	114 (57)	438 (55)	
Raised by both parents	117 (58)	490 (62)	
Poor relations with father^b	29 (26)	95 (22)	
Poor relations with mother^b	22 (19)	89 (21)	
Alcohol problem: father	75 (37)	263 (33)	
Alcohol problem: mother	26 (13)	93 (12)	
Gang member	71 (35)	207 (26)	
Addiction career^b			
Mean age at first arrest	16.1	16.9	*
Mean age at first narcotics use	18.7	19.3	
Mean age first daily use	20.0	20.7	*
Mean age at first legal supervision	22.0	22.4	
Mean age at first methadone maintenance	28.0	27.7	
Mean age at interview	34.9	33.2	**
Length of addiction career (years)	13.2	9.2	**
Number of years under first legal supervision	4.4	3.9	
Ever incarcerated	70 (35)	235 (30)	

a. Chi-square tests were used for frequency tables, and *t* tests were used for the remaining variables.

b. Missing values were excluded from the computation.

p* < .05; *p* < .01.

Except for the contrasts noted above, the analysis sample shared the following characteristics with the excluded sample. The sample consisted of more Whites than Chicanos and more men than women. Most sample members were from middle- or working-class families. About one third of them had unskilled occupations, and the remaining two thirds had semiskilled or skilled occupations. Mean ages at which addiction, treatment, and legal system contact occurred indicate that, generally, first

arrest (16 years old) preceded first narcotics use (19 years old); first use developed rapidly into continued daily narcotics use (20 years old), followed soon after by first legal supervision (22 years old) and subsequently by treatment entry (28 years old).

Repeated Measures ANOVA³

Results of the repeated measures ANOVA analyses are presented in Table 3. Significant differences among the four intervention conditions were observed for many narcotics-related variables. In particular, significant differences among the intervention conditions were observed consistently for narcotics use behaviors and for property crime involvement. For example, the mean percentage of time involved in daily narcotics use for the "neither" condition was 80%; for the LS-only condition (with drug testing), 60%; for the MM-only condition, 26%; and for the LS/MM condition, 21%. The effect of different intervention conditions also was observed in employment and in marital status. On the other hand, no statistical main effect of intervention conditions was found for the following variables: marijuana use, drug dealing for profit, income from theft, and income from drug dealing.

The right-hand side of Table 3 gives results of pairwise comparisons among the four treatment conditions. The comparisons indicate where the statistical differences in intervention effectiveness lie among these conditions. First, although the mean values for the MM/LS combination condition were greater than those for the MM-only condition, the differences generally were not statistically significant. Only abstinence from narcotics use showed a significant improvement under the MM/LS condition compared to the MM-only condition. As for the remaining variables, the effects of the MM/LS condition were statistically equivalent to those of the MM-only condition.

Both conditions involving MM were consistently more effective in improving narcotics-related behaviors than was the LS with drug testing condition. Greater effectiveness was also observed for most of the property crime variables, but not for drug dealing. The LS-with-drug-testing condition demonstrated moderate improvement for narcotics use behaviors and for crime involvement when compared to the no-intervention condition.

DISCUSSION

Characteristics of the Sample

The comparisons of background characteristics between the analysis and the excluded samples suggest that, in general, the analysis sample consists of those with longer addiction careers. Previous studies have shown that for treatment-obtained samples, males have longer addiction careers at admission than do women and Chicanos have longer addiction careers than do Whites (e.g., Anglin, Hser, & Booth, 1987). The patterns observed for these two samples were consistent with these findings. Subjects in the analysis sample, on average, were younger at the time of first arrest, at the time

of first narcotics use, and at the time of first daily use but were older at the time of interview. All these differences are associated with longer addiction careers.

Overall, the background characteristics comparisons indicate that the selected sample consisted of addicts predisposed to longer addiction careers and who were slightly more criminally deviant than addicts in the excluded sample. The actual proportion of addicts with long-term careers within the general population of narcotics addicts is unknown. Nonetheless, given the more frequent intervention episodes and greater crime involvement associated with such addicts, we can assume that the social costs associated with these long-term addicts can be quite high. In this regard, the findings of the present study are informative for understanding intervention effectiveness and for planning optimal cost-efficient strategies for controlling long-term narcotics addiction.

Intervention Effectiveness

Among the variables considered in the present study, only abstinence from narcotics demonstrated the superiority of the joint application of methadone maintenance and legal supervision over other intervention approaches. Methadone maintenance alone also was quite effective, achieving the second-best performance among the four conditions in promoting abstinence. The effectiveness of legal supervision with drug testing also was demonstrated by significant improvement in abstinence over the no-intervention condition. However, this effectiveness was weaker than that of either of the methadone maintenance conditions.

No statistical differences between the MM/LS condition and the MM-only condition were observed for most variables. In particular, there were no significant differences between these two conditions for daily narcotics use or for the average number of fixes per month. Furthermore, crime variables did not show any differences between these two conditions. Nonetheless, both conditions showed significant improvement in addict behaviors compared to the no-intervention condition. Legal supervision with drug testing also demonstrated moderate improvement from the baseline of no intervention, but to a substantially lower degree than did the other two intervention conditions. These findings are consistent with previous studies demonstrating the substantial effectiveness of methadone maintenance and the moderate effectiveness of legal supervision (e.g., Anglin, 1988; Hser et al., 1988; Simpson & Sells, 1983).

The effectiveness of all intervention conditions was most prominent for narcotics use behaviors and for associated crime involvement. Moderate effects also were found in other variables—for example, marriage, employment, welfare, and spouse's narcotics use and spouse's methadone maintenance status. Among all the variables analyzed in this study, only the variables related to common-law spouse (i.e., influence of spouse's behaviors on the subject's narcotics use and on methadone maintenance-status) demonstrated gender differences among the intervention conditions. Overall, the behavior of female addicts was more likely than that of male addicts to be consistent with their spouses' narcotics use behavior. Concordance with spouses' methadone maintenance was demonstrated more often in female narcotics users.

TABLE 3
Comparison of Four Methadone Maintenance/Legal Supervision Conditions^a (n = 202)

	Mean Values			Significant Contrasts							
	Neither	LS	MM	LS/MM	Significance Level	Neither vs. LS	Neither vs. MM	Neither vs. LS/MM	LS vs. MM	LS vs. LS/MM	MM vs. LS/MM
Narcotics use											
Abstinent	10.0	15.1	30.9	36.1	***	Y	Y	Y	Y	Y	Y
Daily	79.5	60.2	25.7	20.5	***	Y	Y	Y	Y	Y	n.s.
Number of fixes	77.2	52.0	23.0	18.6	***	Y	Y	Y	Y	Y	n.s.
Other drug use											
Alcohol	23.3	22.5	33.2	33.3	†	n.s.	Y	Y	Y	n.s.	n.s.
Marijuana	14.7	17.2	19.7	18.2	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Drug dealing											
General	54.8	47.8	39.9	34.0	***	Y	Y	Y	n.s.	n.s.	n.s.
For profit	23.0	18.1	16.4	14.4	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Property crime											
All property crime	38.1	29.6	18.9	17.0	***	n.s.	Y	Y	Y	Y	n.s.
Burglary	18.8	12.6	5.3	4.5	***	Y	Y	Y	Y	Y	n.s.
Theft	21.7	16.6	9.7	9.8	**	n.s.	Y	Y	Y	Y	n.s.

Number of crime days										
All property crime	7.5	5.4	3.2	2.5	***	Y	Y	Y	Y	n.s.
Burglary	2.2	1.4	0.7	0.5	**	n.s.	Y	Y	n.s.	n.s.
Theft	4.3	3.1	1.5	1.5	*	n.s.	Y	Y	Y	n.s.
Employment and marital status										
Employed	34.1	40.0	45.6	50.3	*	n.s.	Y	Y	Y	n.s.
Receiving welfare	12.9	12.3	21.3	18.5	*	Y	Y	Y	n.s.	n.s.
Married	27.6	32.3	40.5	38.8	†	n.s.	Y	n.s.	Y	n.s.
Common-law spouse	25.5	28.8	33.9	36.7	*	Y	n.s.	n.s.	Y	n.s.
Spouse using narcotics	17.2	13.8	11.9	11.1	**	Y	Y	Y	n.s.	n.s.
Spouse on methadone	1.5	4.1	20.7	18.7	***	n.s.	Y	Y	Y	n.s.
Income (in dollars)										
Employment	57.3	69.8	95.2	94.2	*	n.s.	Y	Y	n.s.	n.s.
Welfare	39.4	37.5	70.2	62.1	*	n.s.	Y	Y	Y	n.s.
Drug dealing	118.3	105.9	104.0	75.2	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
All property crime	572.9	478.1	256.2	227.1	*	Y	Y	Y	n.s.	n.s.

NOTE: Variables are measured as percentage of time involved in the activity unless otherwise indicated. All values are monthly averages except employment and dealing income, for which the values are weekly basis.

a. LS = legal supervision with drug testing; MM = Methadone maintenance; † = < .05; Y = significant; * = < .01; ** = < .001; *** = < .0001; n.s. = not significant.

When such addicts were in methadone maintenance (i.e., the methadone maintenance-only condition or the combination condition), their spouses also were likely to be in methadone maintenance. On the other hand, male users did not show the same conformance patterns to the behavior of their spouses. These results suggest that narcotics behaviors of addict spouses have an important impact on addict behavior, particularly in the case of female narcotics users and their spouses. These findings imply that efforts to control narcotics use and related behaviors should target broader and more divergent networks surrounding the addict, including family members of narcotics users, particularly in the case of women.

Intervention effects were not found for marijuana use or for drug dealing for profit. The findings are consistent with the primary objective of these interventions. Behaviors that are less associated with narcotics use (e.g., marijuana use) or that have economic rewards (e.g., dealing for profit) may not be addressed specifically by intervention components. For instance, the marijuana use pattern is not closely associated with the narcotics use pattern. Therefore, intervention efforts that focus on controlling narcotics use may well show minimal effects on marijuana use. Furthermore, although property crime is regarded as a desperate means to obtain narcotics, dealing drugs for profit is also motivated by significant economic rewards. Thus only indirect or minimal effects on drug dealing are expected to be achieved by intervention efforts.

Finally, the indirect effects of intervention (e.g., reduced involvement in the addict lifestyle) may account for the moderate improvement seen in the employment and welfare variables. For the percentage time and the income measures of employment, the results indicated that subjects were more likely to be employed and to earn more income from their employment both in the dual intervention and in the MM-only conditions, compared to the LS-only or the no-intervention conditions. Percentage of time receiving welfare and income from welfare displayed a similar pattern, indicating more dependency on welfare when narcotics users were participating in methadone maintenance. These findings imply that methadone maintenance can be an effective approach to help narcotics users become more productive and prosocial. On the other hand, although legal supervision with drug testing did improve narcotics use and crime involvement, it did not demonstrate such effectiveness in these other behavioral domains.

Implications of the Findings

Overall, the findings indicate that methadone maintenance is an effective approach not only for controlling antisocial behaviors by narcotics users but also for encouraging addict involvement in more productive activities, such as employment. Although the effectiveness of legal supervision with drug testing was not as impressive as that of methadone maintenance, behavioral improvement under legal supervision was demonstrated as compared to the no-intervention condition. Thus legal supervision also is an important approach, particularly when methadone maintenance is not readily

available to a narcotics user. In addition, legal supervision may be necessary to induce or coerce addicts into initial treatment and later to bring them back to treatment if they relapse.

Superior joint effectiveness of the two treatment conditions was demonstrated for abstinence from narcotics use, but not for other variables. However, considering the close relationship between narcotics use and property crime, maintaining abstinence status through the combined approach could have an indirect long-term impact in controlling property crime and in improving other behaviors, ones that might have not been captured in the present study.

Despite the demonstrated effectiveness of methadone maintenance and of legal supervision on various behaviors, there is convincing evidence that narcotics addicts seldom receive appropriate levels of intervention when needed. Table 1 provides the total number of months that the selected sample was under each of the four conditions. These figures indicate that, during approximately 50% of the addiction career, these addicts were not receiving any intervention and, furthermore, that they were using narcotics daily for 75% of the time during these periods of no intervention. Such data imply that more intervention efforts are needed to detect narcotics addicts earlier in their addiction careers and to secure services for them. The present findings on the effectiveness of methadone maintenance and legal supervision would predict positive individual and social outcomes from such an increase in intervention efforts.

NOTES

1. Black clients were excluded from this study because they constituted only a small percentage of the California methadone maintenance patients (less than 5%); thus these data would not be representative of the Black addict population.

2. In determining the time period to be used for these analyses, several alternatives for the career-ending point were considered (i.e., the exact month of last daily use, or 6, 12, 18, or 24 months after last daily use). An examination of these setups revealed that many addicts under methadone maintenance terminated daily use of narcotics for the entire follow-up duration up to the time of interview. There also was a considerable increase in the number of months under methadone maintenance when the period of coverage was extended from the time of last daily use to 6 months after, and there was a further moderate increase from 6 to 12 months. Admission to methadone maintenance tended to result in termination of daily narcotics use considerably more often than did legal supervision. Thus the period of up to 12 months after last daily use was included to define the narcotics use career, to ensure that the intervention effectiveness of methadone maintenance was not underestimated.

3. The possibility of group differences due to gender and ethnicity was investigated, incorporating them as between-group factors in the repeated measures ANOVA. The results indicated virtually no differential intervention effectiveness. There were no three-way interaction effects, and the only two-way interaction found was one between condition and gender for the variables related to spouses' influence on narcotics use, spouses' methadone maintenance participation, and time having a common-law spouse. Except for these variables, the observed pattern of statistical differences among the four intervention conditions were the same across four gender/ethnicity groups. Therefore, the present article focuses mainly on the overall effect of differences among the four conditions. Group differences observed in the spouse-related variables are assessed later.

REFERENCES

- Anglin, M. D. (Ed.). (1988). A social policy analysis of compulsory treatment for opiate dependence [Special issue]. *Journal of Drug Issues, 18*(3).
- Anglin, M. D., Brecht, M. L., & Maddahian, E. (1989). Pre-treatment characteristics and treatment performance of legally coerced versus voluntary methadone maintenance admissions. *Criminology, 27*, 537-557.
- Anglin, M. D., Deschenes, E. P., & Speckart, G. R. (1987, November). *The effect of legal supervision on narcotic addiction and criminal behavior*. Paper presented at the American Society of Criminology Annual Meeting, Montreal, Canada.
- Anglin, M. D., & Hser, Y. (1990). Treatment of drug abuse. In M. Tonry & J. Q. Wilson (Eds.), *Crime and justice: An annual review of research* (Vol. 13). Chicago: University of Chicago Press.
- Anglin, M. D., Hser, Y., & Booth, M. W. (1987). Sex differences in addiction careers: 4. Treatment. *American Journal of Drug and Alcohol Abuse, 13*, 253-280.
- Anglin, M. D., & McGlothlin, W. H. (1984). Outcome of narcotic addict treatment in California. In F. Tims & J. Ludford (Eds.), *Drug abuse treatment evaluation: Strategies, progress and prospects* (NIDA Research Monograph 51, DHHS Publication No. ADM 84-1349). Rockville, MD: National Institute on Drug Abuse.
- Anglin, M. D., McGlothlin, W. H., Speckart, G. R., & Ryan, T. M. (1982). *Shutting off methadone: The closure of the San Diego Methadone Maintenance Program*. Final Report, NIDA grant DA02577.
- Bowden, C. L., & Maddux, J. F. (1972). Methadone maintenance: Myth and reality. *American Journal of Psychiatry, 129*, 435-440.
- Deschenes, E. P., Anglin, M. D., & Speckart, G. R. (1990). *Differential effectiveness of legal supervision on narcotic addict behavior*. Unpublished manuscript.
- Dupont, R. L. (1972). Heroin addiction treatment and crime reduction. *American Journal of Psychiatry, 128*, 856-860.
- Gearing, F. R. (1974). Methadone maintenance treatment five years later—Where are they now? *American Journal of Public Health, 64*, 44-50.
- Hser, Y., Anglin, M. D., & Chou, C.-P. (1988). Evaluation of drug abuse treatment: A repeated measures design assessing methadone maintenance. *Evaluation Review, 12*, 547-570.
- Hser, Y., Anglin, M. D., & Chou, C.-P. (1991). *Reliability of longitudinal retrospective self-report by heroin addicts*. Manuscript submitted for publication.
- Hser, Y., Anglin, M. D., & Powers, K. (1991). *Longitudinal patterns and consequences of narcotics addiction*. Manuscript submitted for publication.
- Hubbard, R. L., Allison, M., Bray, R. M., Craddock, S. G., Rachal, J. V., & Ginzburg, H. M. (1983). An overview of client characteristics, treatment services, and during-treatment outcomes for outpatient methadone clinics in the treatment outcome prospective study (TOPS). In J. R. Cooper, F. Altman, B. S. Brown, & D. Czechowicz (Eds.), *Research on the treatment of narcotic addiction: State of the art* (NIDA Research Monograph, DHHS Publication No. ADM 83-1281). Rockville, MD: National Institute on Drug Abuse.
- Liappas, J. A., Jenner, F. A., & Vicente, B. (1988). Literature on methadone maintenance clinics. *International Journal of the Addictions, 23*, 927-940.
- Maddux, J. F., & Bowden, C. L. (1972). Critique of success with methadone maintenance. *American Journal of Psychiatry, 129*, 440-446.
- McFarlain, R. A., Cohen, G. H., Yoder, J., & Guidry, L. (1977). Psychological test and demographic variables associated with retention of narcotic addicts in treatment. *International Journal of the Addictions, 12*, 399-410.
- McGlothlin, W. H. (1976). California civil commitment: A decade later. *Journal of Drug Issues, 6*, 368-379.
- McGlothlin, W. H., & Anglin, M. D. (1981). Shutting off methadone: Costs and benefits. *Archives of General Psychiatry, 38*, 885-892.
- McGlothlin, W. H., Anglin, M. D., & Wilson, B. D. (1977). A follow-up of admissions to the California Civil Addict Program. *American Journal of Drug and Alcohol Abuse, 4*, 179-199.

- Nurco, D. N., Bonito, A. J., Lerner, M., & Balter, M. B. (1975). Studying addicts over time: Methodology and preliminary findings. *American Journal of Drug and Alcohol Abuse, 2*, 183-196.
- Peck, D. G., & Beckett, W. (1976). Methadone maintenance: A review and critique. *British Journal of Addiction, 71*, 369-376.
- Schnoll, S. H., Goldstein, M. R., Antes, D. E., & Rinella, J. (1980). The impact of legal involvement on substance abusers in a residential treatment setting. *Corrective and Social Psychiatry and Journal of Behavior Technology, Methods, and Therapy, 26*, 21-28.
- Sells, S. B., & Simpson, D. D. (Eds.). (1976a). *The effectiveness of drug abuse treatment: Vol. 3. Further studies of drug users, treatment typologies, and assessment of outcomes during treatment in the DARP*. Cambridge, MA: Ballinger.
- Sells, S. B., & Simpson, D. D. (Eds.). (1976b). *The effectiveness of drug abuse treatment: Vol. 4. Evaluation of treatment outcomes for 1971-1972 DARP admission cohort*. Cambridge, MA: Ballinger.
- Sells, S. B., & Simpson, D. D. (Eds.). (1976c). *The effectiveness of drug abuse treatment: Vol. 5. Evaluation of treatment outcomes for 1972-1973 DARP admission cohort*. Cambridge, MA: Ballinger.
- Sells, S. B., & Simpson, D. D. (1980). The case for drug abuse treatment effectiveness, based on the DARP research program. *British Journal of Addiction, 75*, 117-131.
- Senay, E. C. (1985). Methadone maintenance treatment. *International Journal of the Addictions, 20*, 803-821.
- Simpson, D. D., & Friend, J. (1988). Legal status and long-term outcomes for addicts in the DARP follow-up project. In C. G. Leukefeld & F. M. Tims (Eds.), *Compulsory treatment of drug abuse: Research and clinical practice* (NIDA Research Monograph 86, DHHS Publication No. ADM 88-1578). Rockville, MD: National Institute on Drug Abuse.
- Simpson, D. D., & Sells, S. B. (1983). Effectiveness of treatment for drug abuse: An overview of the DARP research program. *Advances in Alcohol and Substance Abuse, 2*, 7-29.