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Youth Drug Abuse Treatment: A Controlled Outcome Study

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ABSTRACT. Twenty-six youth received six months of treatment (mean of 15 sessions) after random assignment to either a supportive counseling program or to a newly designed behavioral treatment. The behavioral program included several procedures to restructure family and peer relations and to control urges. Drug use was measured by urinalysis, supplemented by family report and self-report. The results showed that during the last month, 9% of youth receiving supportive counseling were abstinent vs. 73% of youth receiving the new behavioral treatment. A greater reduction of drug use was also apparent when measured in terms of urinalysis data alone, days per month of drug use, or overall number of months of abstinence. Improved functioning of youths in the behavioral program was evidenced by significantly greater school/work attendance, improved youth- and parent-relationship satisfaction ratings, improved conduct ratings, decreased depression, and decreased frequency of alcohol use as compared to youth in the supportive counseling program.

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INTRODUCTION

A recent study of drug abuse by the present authors (Azrin, McMahon, Donohue, Besalel, Lapinski, Kogan, Acierno, & Galloway, in press), evaluated a new behavioral method of treating illegal drug abuse. That study involved a twelve month controlled comparison of supportive counseling and behavioral techniques similar in nature to the present experiment but was comprised largely of adults; only 14 subjects (17%) were youth. Since drug use usually begins at an early age (Hunt, 1977) the effectiveness of this new program in interrupting drug use before adulthood is especially important. Indeed, no controlled group outcome study has previously demonstrated an effective method of treating drug abuse in youth. The purpose of the present experiment, therefore, was to increase the number of youth in the study sample, albeit for a shorter period (6 months), thereby permitting more valid conclusions regarding the effectiveness of the program with this important subpopulation.

METHOD

The method, experimental design, and assessment measures were identical to those employed in the previous study which contained fewer youth subjects (Azrin et al., in press). The details of the method are nevertheless described here in some detail to provide a more self-contained report.

Subjects

Twenty-six youth served as subjects in the final study sample. The criteria for inclusion were that subjects (1) were 18 years of age or younger and had engaged in illegal drug use other than, or in addition to, alcohol use, during the past month, (2) were not receiving other psychological/psychiatric treatment, (3) resided within 12 miles of the counseling center, (4) resided locally for the past six months and had no plans for moving outside this locale, (5) completed 4 or more treatment sessions, and (6) were willing to provide drug use data for 6 months following initiation of treatment. Partici-

pants were recruited from agencies, schools, and newspaper advertisements. Informed consent to participate was obtained from the parent(s) as well as subjects. Fourteen of the 26 subjects had been used in the previous study (Azrin et al., in press) of which the present study is an extension.

Demographics. Table 1 lists the characteristics of the subjects. Seventy-seven percent were male, 23% female. Subjects' mean age was 16.0 years (range: 13-18 years), with an average of 9.5 years of completed education. Nineteen percent of the subjects had dropped out of school. Referral was by an agency or school for 58% of the subjects, while the other 42% were referred by the family. Minority group (e.g., African-American or Hispanic) members comprised 19% of the study sample. Drug use was principally marijuana: 96%, cocaine/crack: 35%, and hallucinogens: 31%, with many subjects using more than one drug.

In order to assess comparability of subjects in the two treatment conditions (described below), a t-test (2-tailed) or chi square was performed for each of the demographic characteristics listed in Table 1. None of the characteristics differed significantly between the two treatment conditions ($P > .05$) at pre-treatment.

Experimental Design. After an initial one-month baseline/assessment period, the eligible participants were randomly assigned by a coin flip to either the behavioral or supportive treatment program. When two youth were concurrently available for assignment to condition, the coin flip determined which one was assigned to the behavioral treatment, the other being assigned to the supportive treatment. The final study sample consisted of 15 subjects in the behavioral and 11 subjects in the supportive treatment. As noted above (Demographics) subjects in the two treatment conditions did not differ significantly on any of the demographic characteristics listed in Table 1.

Measures. All subjects were accompanied by a parent(s) to the sessions. Accordingly, reports were obtained from both the subject and parent at each session regarding type and frequency of drug use, school attendance, employment, institutionalization, and arrests for the period since the previous session. In addition, parents completed the Parent Satisfaction Scale (Besalel & Azrin, 1981) which included a rating by the parent (0-100%) of overall satisfac-

TABLE 1. Demographic characteristics and drugs used at pre-treatment for the sample of 26 youth.

Characteristic	Mean	N	Percent of Sample
Males		20	77%
Females		6	23%
Age (mean)	16.0 years		
Age (range)	13-18 years		
Education (mean)	9.5 years		
School Drop-Outs		5	19%
Minority Persons		5	19%
Family Referred		11	42%
Agency/School Referred		15	58%
Marijuana Users		25	96%
Cocaine Users		9	35%
Hallucinogen Users (LSD)		8	31%
Methamphetamine Users		1	4%
Benzodiazipine Users		1	4%

tion with the parent-youth relationship. The youth completed a similar Youth Satisfaction Scale (Besalel & Azrin, 1981) which included a similar rating (0-100%) by the youth of his/her overall satisfaction with the youth-parent relationship. Depression in youth was assessed by the Beck Depression Inventory (Beck et al., 1961). To assess overall adjustment of the youth, the Quay Problem Behavior Checklist (conduct subscale) (1977) was administered. The Beck Depression Inventory, the Happiness Scales and the Behavioral Problem Checklist were scheduled monthly.

Urinalysis. A urine sample was obtained each session. One sample each month during treatment underwent a broadscreen assay for

all commonly used drugs by the National Health Labs, an independent national testing facility with 95.5% accuracy. During pre-treatment, this broad screen analysis was performed for every urine specimen. During the 6-month treatment period, the broadscreen analysis was performed once per month from the samples available for the month. All other urine samples were analyzed for the specific drugs that had been detected on any of the broadscreen analyses by the Abusescreen Ontrak method (Roch Diagnostic Systems, Nutley, N.J.) which showed 97% agreement with the broadscreen assay results in our reliability tests.

Treatment

Counselors. The counselors in both treatment conditions were college graduates or graduate students who had general training and/or experience in their respective treatment modality.

Treatment Integrity. To assure adherence to the intended treatment program, audiotapes were made of all sessions. Random tapes were subsequently reviewed weekly by the first author and feedback was provided to each counselor. In addition, a session checklist comprised of procedures specific to each treatment modality was used by counselors, and was also reviewed weekly.

Sessions. Sessions were one hour in duration for individual counseling and two hours for group counseling. For the behavioral program, hourly individual sessions were scheduled twice per week during the initial stages of treatment, and then reduced in frequency when progress was apparent. For the supportive program, group sessions were scheduled weekly and were two hours in duration. Parental presence during the sessions differed between treatment conditions. For supportive treatment sessions, the common format of a "parent's day" was adopted in which parents attended sessions once per month. For the behavioral intervention, parents attended each session since active parental participation was an integral part of the treatment (e.g., parent-youth contracting, communication training, parent therapy assignments, etc.).

Supportive Counseling. The supportive program was designed to include the principal features of supportive counseling, emphasizing expressions of feeling, self attempts at insight, discussions of

drug-related experiences and feelings, and group interaction, with no specific directives by the counselor.

Behavioral Program. The typical behavior therapy format was used and consisted of therapist modelling, rehearsal, self-recording, written therapy assignments, and review of these assignments in the session. The principal specific procedures were (1) Stimulus Control, (2) Urge Control, and (3) Contracting.

Stimulus Control. For each subject, a highly specified and comprehensive "safe" and "risk" list was constructed. The "safe" list was comprised of situations (e.g., social, temporal, etc.) in which drug use was unlikely, while the "risk" list was comprised of situations in which drug use was likely. Subjects monitored the time spent in each situation on both lists each day. The counselor, youth and parent(s) reviewed the lists and problem-solved how to increase individual "safe," and decrease individual "risk" durations. Standard situations included in the "safe" list were school attendance, homework, home chores, family activities, and adult-supervised activities.

Urge Control. The urge control procedure was designed to interrupt internal stimuli (proprioceptive sensations, incipient actions, urges, or thoughts) that were precursors to drug use, and to then substitute other competing internal and external stimuli which led to non-drug behaviors. The specific steps of the technique as practiced in session were to (1) identify a recent drug use episode to be used as a rehearsal scene, (2) describe aloud particular aspects of this scene until initial drug-urges (an urge rated at "5" or less on a 0 to 100 scale, where 0 represents no urge and 100 represents uncontrollable urge) were perceived, (3) interrupt these urges or feelings by exclaiming "No!" or "Stop!" followed immediately by affect-laden statements describing personalized negative consequences of drug use, (4) engage in relaxation for about five seconds after the drug feelings were reduced to zero (5) immediately initiate a drug-incompatible activity with expressions of its associated positive reinforcement. After each trial, the subject and counselor independently rated the adequacy of each step. Where appropriate, descriptive reinforcement was provided, or advice given for needed improvement.

Social Control/Contracting. This third major procedure empha-

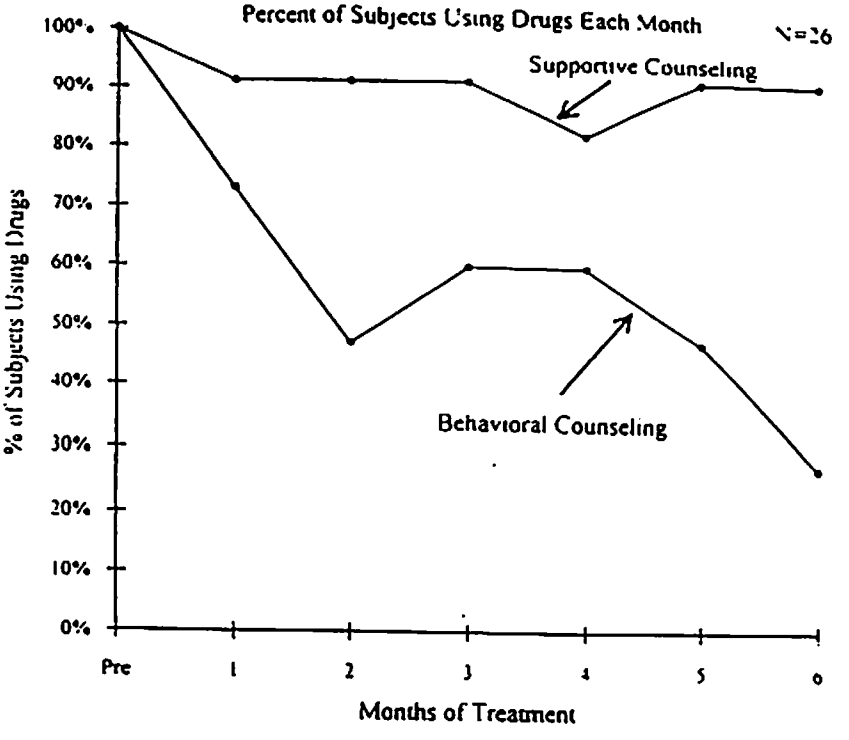
sized parental assistance in providing youth with activities on the Safe List and alternatives to those on the Risk List, as well as transportation to counseling sessions, and supervision of home urge-control assignments. Behavioral contracting consisted of structured parental reinforcement of drug-incompatible activities, and employed a written specification of desired behaviors, contingent reinforcers, and point exchange values. Standard drug-incompatible activities were early curfew adherence, school attendance, homework, written daily scheduling of activities, social interactions with parent(s), household chores, session attendance, parental notification of all non-scheduled activities, absence of Risk List activities, and presence of Safe List activities. Typical reinforcers included increased allowance, transportation by parent, use of family car, later curfew, overnight visits to or by Safe List friends, reduced session attendance, room privacy, special gifts of clothing or recreational items, and telephone, stereo, and television privileges.

Secondary Procedures. These included Annoyance Review (Azrin & Nunn, 1973) with all subjects to identify and increase motivation for abstinence. Other secondary procedures were used only as needed and included (1) Annoyance/Anger Prevention, (2) Positive Request procedure for facilitating requests for reinforcement (Besalel & Azrin,1981), (3) Relationship enhancement for enhancing non-contingent relationship reinforcers (Azrin, Naster, Jones, 1973), and (4) Problem-solving training (D'Zurilla & Goldfried, 1971) for constructing stimulus control lists.

RESULTS

Figure 1 shows the time course of illegal drug use for each of the six months of treatment. Drug use was considered to have occurred in a given month if a positive report of drug use at any time during that month was obtained from either urinalysis, self-report, or parental report. One-hundred percent of subjects had used drugs during the month preceding treatment. Figure 1 shows that 91% of youths in the supportive treatment continued to use drugs during all but one month of the study. Of youths receiving the behavioral treatment, 73% used drugs during the first month, decreasing irregularly to 27% usage during the 6th month, for an overall reduction

FIGURE 1. Percentage of subjects in each condition using drugs each month. "Pre" designates the month preceeding treatment.

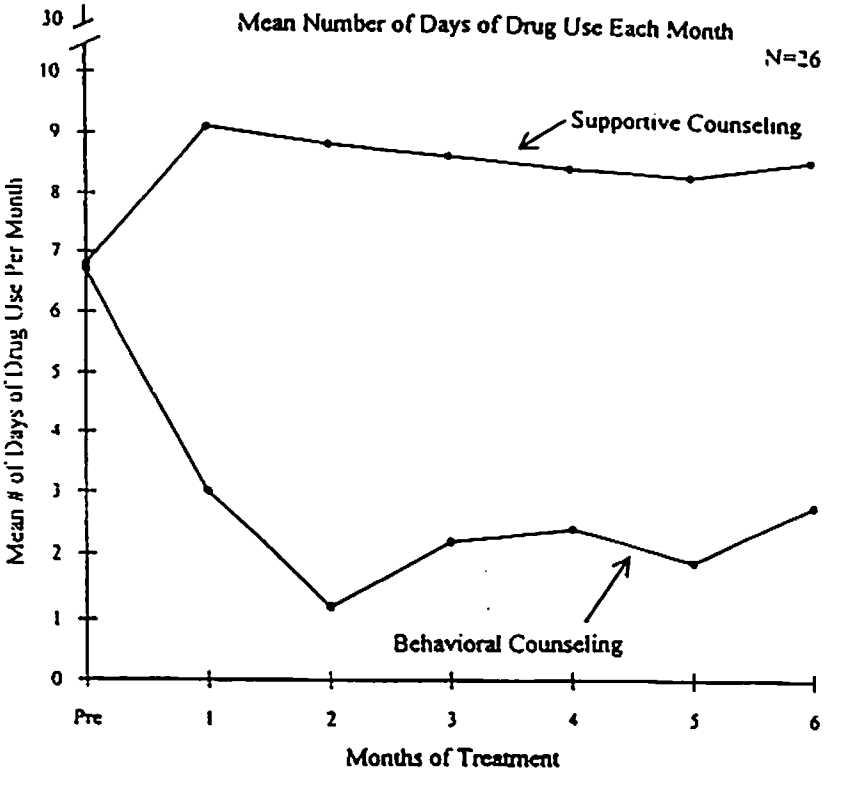


of 73% in the number of youth using drugs. Chi Square tests at each month (d.f. 1, N = 26) showed that the difference between treatments was statistically significant ($p < .05$) for months 2, 5 and 6. For the 6th month, Chi square = 10.54 ($p < .02$).

Figure 2 shows the mean number of days of drug use. Drugs were used about 7 days per month prior to treatment by the youth in both conditions. During the treatment period, monthly drug use in subjects receiving behavioral counseling decreased to about 2 days/month by the second month and remained at that level, while monthly drug use in subjects receiving supportive counseling increased slightly to about 9 days/month and remained at that level.

Drug Use. Table 2 presents the data for drug use averaged for the

FIGURE 2. Mean number of days of drug use per month for 26 youth who received either supportive or behavioral treatment. "Pre" designates the month preceeding treatment.



entire 6 months of treatment, as ascertained by different methods of measurement of drug use, for the two treatment conditions. The first method shown is the same as was used for the data in Figure 1: mean number of months of drug use as indicated by either urinalysis, self-report, or parental report. This method showed that drug use occurred for a mean of 3.1 months for the behavioral treatment vs. 5.4 months for the supportive counseling treatment, which is a 43% reduction in drug use for the behavioral treatment, relative to the supportive counseling treatment. The second method of expressing drug usage, shown in Table 2, employed only the more objective urinalysis results expressed in terms of the number of months in

TABLE 2. Alternate measures of drug use Pre-treatment (1 month) and during Treatment (6 months) for the two treatment conditions.

	Pre-treatment (1 month)		Treatment (6 months)				
Measure	Supportive Mean (s)	Behavioral Mean (s)	Supportive Mean (s)	Behavioral Mean (s)	N	t	p
Months of drug use (urinalysis, self, or parent report)	1.0 (0)	1.0 (0)	5.4 (1.0)	3.1 (2.4)	26	2.87	<.005
Months of drug use (urinalysis only)	.9 (.3)	.7 (.5)	4.4 (1.8)	2.8 (2.4)	26	1.94	<.05
Days per month of drug use (urinalysis, self, or parent report)	6.8 (5.3)	6.4 (7.4)	8.5 (8.1)	2.3 (2.9)	26	3.12	<.005

which a positive (indicating drug use) result was obtained. The means are adjusted for the months for which a urinalysis was not available. This method similarly showed less usage for the behavioral treatment than for the supportive treatment: 2.8 months of use vs. 4.4 months, respectively, which is a 36% reduction for the behavioral treatment, relative to the supportive counseling treatment. The third method of expressing drug usage was mean number of days per month of drug use, as was illustrated in Figure 2. In Table 2 it is calculated as the average for the entire 6-month treatment duration, whereas in Figure 2 it is illustrated month-by-month). This method gave less emphasis to the urinalysis results, since a positive urine result can conservatively be presumed to demonstrate use on one day only. This measure showed a 73% reduction of drug use for the behavioral treatment relative to the supportive treatment: 2.3 vs. 8.5 days use per month, respectively.

Number of Urinalyses. The mean numbers of urine tests given per month differ slightly between the two treatment conditions. During treatment, a mean of 12.6 urinalyses were obtained for the

supportive treatment and 14.2 for the behavioral. This difference was not significantly different (d.f. 26, t = 0.73, p = .47).

Drug Related Measures. Table 3 presents the drug-related test scores and behaviors for the two conditions for the pre-treatment and treatment period. Table 3 shows that the percent attendance at school or work increased significantly from pre-treatment in subjects receiving behavioral treatment and decreased slightly for subjects receiving supportive counseling. Relative to the pre-treatment period, reported alcohol use decreased by about 50% for behavioral treatment subjects, and increased by about the same percentage for supportive counseling subjects. Mean scores on the Beck Depression Inventory showed a large decrease for behavioral subjects, but only a slight decrease for supportive counseling subjects. Perhaps the largest change was for parents' satisfaction ratings with youth, which, for the parents of the youth receiving the behavioral treatment, changed from 42% overall satisfaction at pre-treatment to 72% overall satisfaction during treatment, whereas the satisfaction rating by parents of youth receiving supportive counseling remained unchanged at 50%. Similarly, for youth's satisfaction with the parent, the rating remained unchanged for the supportive treatment (63%), but increased for the behavioral treatment, but only to a marginally and statistically insignificant level (p = .07) relative to the supportive treatment. The number of days of institutionalization and the number of days of legal contact were slight in magnitude for all subjects (less than one day per month), and did not change differentially for either treatment condition.

Statistical analysis by t-tests of the pre-treatment scores for all measures in Table 3 showed no significant difference between treatment conditions during pre-treatment (p > .05). The measures designated in Table 3 were taken repeatedly; the data for each measure is the average score for the period designated (i.e., "Pre-treatment" scores are averaged over one month and "Treatment" scores are averaged over 6 months). The slightly reduced "N" reported for some measures reflects missing or unusable data for some subjects. This problem occurred primarily for the pre-treatment period for those measures that were scheduled for only one administration during that period (e.g., the Problem Behavior Checklist, BDI and Parent/Youth satisfaction scales). The results shown in Table 3 were

TABLE 3. Drug-related behaviors and test scores averaged during Pre-treatment (one month) and during Treatment (6 months).

	Pre-treatment		Treatment				
	Supportive Mean (s)	Behavioral Mean (s)	Supportive Mean (s)	Behavioral Mean (s)	N	t	p
School or Work Attendance (% days/month)	79.5 (26.2)	50.2 (44.2)	68.4 (21.2)	65.4 (31.1)	25	2.05	<.05
Alcohol Use (days/month)	3.2 (4.2)	2.2 (2.2)	4.5 (3.7)	1.5 (2.4)	26	1.90	<.05
Parent Satisfaction (0–100%)	50 (16.2)	42.3 (25.2)	49.6 (27.9)	72.4 (17.3)	23	2.93	<.01
Youth Satisfaction (0–100%)	62.8 (28.4	68.9 (28.3)	63.6 (29.5)	85.2 (19.1)	23	1.53	=.07
Behavior Problems (Quay Problem Behavior Checklist)	21.2 (10.6)	22.5 (12.9)	19.9 (10.6)	14.3 (9.1)	18	1.94	<.05
Depression (Beck Depression Inventory)	6.5 (6.2)	15.2 (12.3)	5.5 (6.8)	6.5 (8.7)	23	2.05	<.05
Legal Contacts (#/month)	.9 (1.8)	.4 (.8)	.3 (.6)	.1 (.2)	26	.78	=.22
Institutionalized (days/month)	0 (0)	0 (0)	.5 (1.4)	.4 (1.3)	26	.20	=.42

*one-tailed t-test

based on a one-tailed t-test, since the hypothesis was that the behavioral treatment would be more beneficial. Specifically, the analysis consisted of a t-test of differences between pre-treatment vs. treatment scores between treatment conditions.

Sessions. The mean number of treatment sessions received during the 6-month treatment period was 15.1 for behavioral subjects and 14.9 for supportive counseling subjects. This difference was not statistically significant (d.f. 24, $t = .09$; $p = .93$). Overall session

frequency, therefore, averaged one every 1.7 weeks (26 weeks ÷ 15 sessions). During the first month, average frequency was 3.6 sessions per month for supportive counseling and 3.7 sessions per month for the behavioral treatment. During the last, 6th month, the mean was 1.7 sessions per month for supportive counseling and 1.6 sessions per month for the behavioral treatment.

Dropouts and Data Retrieval. All of the above data is for the final subject sample of 26 youths who completed at least four treatment sessions and whose drug use data was obtainable for the full 6-month period. Three other youths started treatment (all in the supportive condition) but did not attend 4 sessions. To determine pre-treatment comparability of the extent of drug use of these 3 dropouts to the rest of the study sample, their pre-treatment scores on the number of days of drug use was compared to the scores of the 26 youths in the final sample. The difference was not statistically significant (d.f. 27, $t = 0.32$, $p = .75$) indicating no evidence of incomparability. The dropout rate can be considered to be about 10% because 3 of the 29 youths started but did not complete treatment. The drug usage data retrieval for the 26 subjects who completed treatment was 100%, in that data was available for all of the 26 subjects who completed 4 or more sessions.

DISCUSSION

Illegal drug use was reduced by the behavioral program to a relatively greater extent than by the supportive program. The magnitude of the effect was fairly substantial depending on the method of assessing usage: a 73% reduction in the number of youths using drugs at the *end* of treatment, a 43% reduction in the mean number of months of drug usage *during* the 6 months of treatment, a 73% reduction in the mean number of *days* of drug use during treatment, and a 37% reduction in the number of months of usage when only urinalyses were considered. Since drug usage can be expressed in several ways, the concordance of these varied methods of measurement lends greater credibility to overall conclusions regarding the efficacy of the new treatment program. The magnitude of change in drug use resulting from the behavioral therapy is clinically, as well

as statistically significant, relative to the change produced by supportive counseling.

The behavioral program also produced significantly greater improvements, relative to the supportive program, in several areas related to drug use. The psychological state of the youth was improved as evidenced by the finding that depression decreased from a mild/moderate level to a non-depressed/normal level. School/employment attendance was found to have improved substantially. (School attendance and employment data were grouped together as being more meaningful than a separate analysis since: (a) no school attendance was possible during the summer vacation months, but employment was possible; (b) for the school dropouts, gainful employment may be viewed as functional and appropriate as an alternative to school.) Overall adjustment improved, as measured by the Quay Problem Behavior Checklist, as did family relationships, as measured by the Parent Satisfaction Scale, and the Youth Satisfaction Scale, to a significantly greater extent in the behavior therapy condition. Alcohol use was significantly reduced in subjects receiving the behavioral intervention, but increased in subjects receiving supportive counseling. Alcohol usage has been analyzed separately here and was not included as an illegal drug, although technically, such use is classified as illegal for persons under 21 years of age in this municipality (Florida). The rationale for this exclusion in the present analysis is that alcohol use is a "status" offense, being illegal only for youths and not for adults, unlike the other drugs which were illegal at any age.

The data showed no change in number of legal contacts or related institutionalizations (prison or hospital). The absence of change is likely attributable to the extremely low incidence of these problems with this sample, both before and during treatment.

The behavioral treatment inherently established high standards of conduct regarding curfew, school attendance, peer associations, discretionary spending, time spent with family, etc. One may therefore ask whether an adversarial parent-youth relationship and personal psychological stress were a concomitant of the drug reduction program. However, results indicate the converse was true; (a) Youth and Parent Relationship Satisfaction ratings increased, and (b) the level of depression of the youth decreased. The basis for increases

in relationship satisfaction was possibly attributable to the increased level of alternative reinforcers, the increased participation in positive family activities, the improved communication between parents and youth, and the clear definition of parental standards, all of which were explicit features of the behavioral program. Nor was there evidence that the treatment sessions were aversive inasmuch as none of the treatment dropouts were in the behavioral program. It appears, therefore, that in spite of its prescriptive nature and requirements of high standards of conduct, the behavioral program improved psychological functioning and family relationships.

Results of the present study with 26 youth generally confirm and extend results of a previous study performed by the present authors (Azrin et al., in press), which had included 14 of these youth. That study had indicated an especially large drug use reduction with youth as compared to adults receiving the behavioral intervention. The present study, employing a larger sample, also achieved a large reduction of drug use with youth, and extends previous findings to show improvements for the youth in school/work attendance, psychological functioning, parent-youth relations, and decreased alcohol use.

The present study appears to be the first controlled group outcome study to demonstrate an effective psychological treatment program for substantially decreasing youth drug abuse. Similar conclusions have been suggested by many previous uncontrolled or case studies of behavioral programs, primarily with adults, such as those by Dolan et al., (1976, 1986) Boudin et al., (1977) and Stitzer et al., (1977). Recently, Budney et al. (1991) and Higgins et al. (1991; 1993) have demonstrated a similar large reduction of drug use with a somewhat similar behavioral program for adult drug users, thereby lending additional credibility to the utility of this behavioral community-reinforcement approach.

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