Outcome Trajectories in Drug Court: Do All Participants Have Serious Drug Problems?

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OUTCOME TRAJECTORIES IN DRUG COURT

Do All Participants Have Serious Drug Problems?

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Graduation rates in drug courts average 50% to 70%, but it is unclear what proportion of graduates responded to the drug court services and what proportion might not have had serious drug problems on entry. This study cluster analyzes urine drug screen results during the first 14 weeks of treatment on 284 participants from three misdemeanor drug courts. A four-cluster solution ($R^2 > .75$) produced distinct subgroups characterized by (a) consistently drug-negative urine specimens (34% of the sample), (b) consistently drug-positive specimens (21%), (c) consistently missed urine specimens (26%), and (d) urine specimens that began as drug positive but became progressively drug negative over time (19%). These data suggest that approximately one third of the participants might not have had serious drug problems on entry. Approximately one fifth appeared to respond to drug court services, and nearly one half continued to exhibit problems after 14 weeks. Implications for adaptive programming in drug courts are discussed.

Keywords: drug courts; drug-involved offenders; criminal justice; cluster analysis

Drug courts are special criminal court dockets that provide judicially supervised substance abuse treatment and case management services to nonviolent, drug-involved offenders in lieu of criminal prosecution or incarceration. According to the National Association of Drug Court Professionals (NADCP, 1997), the "key components" of a drug court include ongoing status hearings before the judge to review participants' progress, mandatory completion of substance abuse treatment and indicated adjunctive services, random weekly urine drug screens, and progressively escalating negative sanctions for infractions and positive rewards for accomplishments. In preadjudication drug courts, graduates have the criminal charge or charges dropped and may be eligible for record expungement after remaining arrest free for a statutorily prescribed waiting period and meeting other obligations, such as paying a filing fee. Record expungement ordinarily permits the individual to

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respond truthfully on an employment application or similar document that he or she was not arrested for or convicted of the offense (Festinger, DeMatteo, Marlowe, & Lee, 2005). In postadjudication drug courts, graduates may avoid incarceration, reduce their probationary obligations, or receive a sentence of time served in the drug court program.

The drug court model assumes that participants have a serious drug use problem that fuels or exacerbates their criminal activity (NADCP, 1997). As a result, participants must satisfy an intensive regimen of treatment and supervisory obligations. Evidence suggests, however, that a sizeable proportion of drug offenders do not have a diagnosable substance use disorder (e.g., Kleiman et al., 2003). Studies in several adult drug courts have reported that nearly one half of misdemeanor participants (Marlowe, Festinger, & Lee, 2003; Marlowe, Festinger, Lee, Schepise, et al., 2003) and one third of felony participants (Marlowe, Festinger, & Lee, 2004) produced subthreshold drug abuse composite scores on the Addiction Severity Index (ASI) (McLellan et al., 1992) that were not significantly different from a community sample of non-treatment-seeking individuals. Despite having been screened in by program personnel as requiring formal drug treatment, the results of more in-depth assessments have suggested that these individuals may not have had an identifiable substance use disorder.

These findings raise a question about how to interpret graduation rates in drug courts. Nationally, drug courts report unusually high graduation rates averaging 50% to 70% (Belenko, 1998, 2001; Belenko, DeMatteo, & Patapis, 2007; General Accounting Office, 1997). It is unclear, however, what proportion of those graduates entered the drug court programs with serious drug problems and responded to the drug court services and what proportion might not have had serious drug problems to begin with. If, in fact, as many as 25% to 30% of drug court clients do not have a serious substance use disorder, then cases manifesting actual symptom improvement might represent roughly half of the graduating cohorts. Moreover, providing high-intensity services to non-clinically-disordered individuals might waste resources, take treatment slots away from addicted offenders, or disrupt the clinical operations of the treatment programs. On the other hand, administering self-report assessments at or near entry to treatment could underestimate the severity of participants' substance use problems (Peters et al., 2000). Some offenders might deny to themselves or minimize to others the degree of their drug involvement. They may have poor insight into their actions or be unwilling to disclose illicit activities to criminal justice authorities. Exclusively relying on self-report assessments could, therefore, lead to high false negative rates and the denial of drug court services to otherwise needy individuals.

The provision of appropriately tailored clinical services to drug court clients is consistent with the risk–needs–responsivity (RNR) model (Andrews & Bonta, 2006). The RNR model posits that interventions with criminal offenders are most effective if the interventions are properly tailored to the specific criminogenic needs of offenders. As such, tailoring treatments to drug court clients based on their drug use severity would likely be more effective than a one-size-fits-all treatment approach.

The current study seeks to shed light on these issues by analyzing the outcome trajectories of 284 participants in three adult misdemeanor drug court programs. Urine results were selected as the dependent measure because (a) abstinence is one of the primary goals of a drug court program, (b) urine screens are objectively measured (i.e., not derived from self-report) and therefore are a reliable indicator of drug use during the program, and (c) urine data are collected on a weekly basis and thus can be longitudinally analyzed. Exploratory

cluster analytic techniques were used to identify typologies of participants characterized by different trajectories of treatment response. We were particularly interested in determining whether there was a subgroup of participants who achieved abstinence early in the programs and remained continuously abstinent thereafter. Such a profile might reflect individuals who did not have serious drug problems on entry. It is important to note that because this study was conducted in misdemeanor drug courts, it might be expected that a greater proportion of participants would meet this profile as compared to felony drug courts that treat a more serious drug offender population.

We were also interested in identifying a subgroup of participants who provided drug-positive urine specimens early in the drug court programs but who eventually achieved sobriety over time. This profile might reflect what would generally be considered the desired outcome of a drug court program; that is, individuals enter the drug court program with high levels of drug involvement but reduce or eliminate their drug use after receiving treatment and other services.

Finally, we sought to determine whether baseline ASI drug composite scores significantly distinguished cluster membership and predicted trajectories of drug use during participants' enrollment in the drug court programs. The ASI is commonly used in drug court and drug abuse treatment programs, so examining its ability to predict during-treatment drug use trajectories has clear importance. This would provide information about whether self-report assessment results can identify the appropriate target population for a drug court program.

METHOD

PARTICIPANTS

The sample consisted of 284 adult drug offenders participating in three misdemeanor drug court programs in Delaware. The drug courts were located in the urban city of Wilmington, the state capital of Dover, and the rural community of Georgetown. Eligibility criteria for these programs required defendants to be 18 years of age or older; to have been charged with a misdemeanor drug offense involving possession or consumption of cannabis, possession of drug paraphernalia, possession of hypodermic syringes, or first-time driving under the influence; and to not have a history of an offense involving drug dealing or manufacturing, death or serious injury to a victim, or use of a deadly weapon.

Of the 284 participants, 183 (64%) were from Wilmington, 71 (25%) were from Georgetown, and 30 (11%) were from Dover. They were predominantly male (77%), young adult ($M = 25.0$, $SD = 8.0$ years), Caucasian (57%) or African American (37%), unmarried (82%), and high school educated ($M = 11.7$, $SD = 1.5$ years). Of the participants, 32% met diagnostic criteria of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV*; American Psychiatric Association, 1994) for antisocial personality disorder (APD), and 25% reported a history of drug abuse treatment. There were no significant differences among the three drug court programs in terms of participants' age, gender, marital status, years of education, rates of APD, or history of drug abuse treatment. However, there was a significantly greater proportion of African Americans in the Wilmington sample (44%) as compared to Dover (20%), $\chi^2(2, n = 213) = 7.46$, $p = .02$, and Georgetown (24%), $\chi^2(2, n = 254) = 9.19$, $p = .01$.

Of the participants, 87% (n = 248) were recruited as part of experimental studies investigating the effects of judicial status hearings on drug court outcomes. These participants were randomly assigned to meet with the judge for status hearings every 2 weeks (biweekly condition) or to be monitored by their clinical case managers who requested status hearings only as needed in response to poor performance in treatment (as-needed condition). The results of those studies revealed no main effects of the experimental conditions; however, there were significant interaction effects, in which participants who had (a) APD or (b) a history of drug abuse treatment performed significantly better in the biweekly condition (Festinger et al., 2002; Marlowe, Festinger, Dugosh, & Lee, 2005; Marlowe, Festinger, & Lee, 2003, 2004). For this reason, the clusters were compared on the variables of experimental condition (biweekly vs. as needed), APD (yes or no), and prior drug treatment (yes or no) to determine whether these variables would need to be statistically controlled for in between-cluster comparisons. The remaining 13% (n = 36) of the participants were recruited from a natural history study that examined standard treatment in the drug courts. Because there was no experimental manipulation in the natural history study, it was not necessary to examine potential covariates for inclusion in the between-cluster comparisons. The experimental participants were recruited from all three drug courts, whereas the natural history participants were recruited from the drug courts in Dover and Georgetown.

BRIEF DESCRIPTION OF THE DRUG COURT PROGRAMS

The three drug court programs are similar in structure. Although there are minor differences in graduation criteria, the core graduation criteria are the same in all three drug courts. The programs are scheduled to be a minimum of 4 or 6 months in length (depending on the jurisdiction), although most participants require 6 to 8 months to satisfy the conditions for graduation. To graduate, participants must, at a minimum, complete a standard regimen of 12 weekly psychoeducational group counseling sessions, provide at least 14 consecutive drug-negative urine specimens, remain arrest free, and pay a $200 court fee.

The psychoeducational group sessions cover a standard sequence of prevention topics, including the pharmacology of drug and alcohol use, progression from substance abuse to dependence, the impact of addiction on the family, treatment options, HIV/AIDS risk reduction, and relapse prevention strategies. Participants provide urine specimens on a random, weekly basis in direct observation of a same-gender treatment staff person, and all urine drug screens are performed by an independent certified laboratory.

The judges are authorized to administer punitive sanctions or remedial interventions as consequences for poor performance in the program. These consequences may include verbal reprimands, written homework assignments, additional treatment or supervisory obligations, or day-long attendance in court as an observer. The judge or treatment team can also administer rewards for good performance, including verbal praise, token gifts, certificates of recognition, and reductions in participants' treatment or supervisory obligations.

MEASURES

Baseline. Participants received a $20 check for completing a baseline assessment battery that was administered by trained research technicians. This battery included the fifth edition of the ASI (McLellan et al., 1992), which assesses current (past 30 days) and lifetime

problems in several domains: drugs, alcohol, legal matters, medical issues, family and social matters, employment, and psychiatric matters. The ASI yields "composite scores," based on events occurring during the previous 30 days, that are global indicators of problem severity in each domain. Composite scores range from 0.00 to 1.00, and they were developed by selectively combining items from within each of the ASI problem areas (McGahan, Griffith, Parente, & McLellan, 1986). In prior research, a drug composite score of ≤ .04 efficiently differentiated non–drug users from clinical samples of drug abuse clients (Lee et al., 2001). As such, a drug composite score of ≤ .04 is considered to be subthreshold for a drug use disorder. Multiple studies of ASI composite scores and lifetime items have yielded impressive evidence of reliability, concurrent validity, predictive validity, and discriminative utility across groups of clients characterized by age, race, gender, and primary drug of abuse (e.g., Alterman et al., 1998; Cacciola, Koppenhaver, McKay, & Alterman, 1999; McDermott et al., 1996; McLellan et al., 1985; McLellan et al., 1992; McLellan, Luborsky, O'Brien, & Woody, 1980).

Participants were also administered an "Antisocial Personality Disorder Interview," which is a 29-item, true–false structured interview that assesses official diagnostic criteria for APD contained in the revised fourth edition of the *DSM* (*DSM-IV-TR*; American Psychiatric Association, 2000). In interrater reliability scoring trials, there was between 90% and 100% exact agreement for dichotomous diagnoses of APD among our research technicians.

Finally, participants completed a "Prior Treatment Questionnaire" that inquired about prior drug abuse treatment episodes, the density of services for each episode, discharge status, satisfaction with treatment, and the longest interval of abstinence attained during and after each episode. A single dichotomized (yes or no) item inquiring whether the participant experienced any prior drug abuse treatment (excluding self-help groups) was used for the interaction analyses described above and in the cluster-validation analyses for the current study. Interrater reliability and test–retest stability for this item were consistently above 95% in all of our prior studies.

During-treatment performance. Measures of during-treatment performance included participants' attendance at scheduled sessions, results of random weekly urine drug screens, and graduation rates. Urine specimens were delivered in the presence of a same-gender treatment staff person, and drug screens were performed by an independent certified laboratory using the enzyme multiplied immunoassay technique with gas chromatography–mass spectrometry confirmation of positive results on a six-panel screen for cannabis, alcohol, opiates, amphetamines, cocaine, and phencyclidine (PCP), plus any additional substances believed to be used by the individual. The urine specimens were tested for evidence of tampering or invalidity based on an analysis of creatinine, pH, and specific gravity in accordance with standard laboratory testing guidelines. In line with the policies of the drug courts, invalid or tampered specimens were presumed to be drug positive, and the specimens were not credited as having been delivered as directed.

Follow-up measures. Participants were scheduled to provide a confidential urine specimen at 6 and 12 months postadmission to the drug courts. The follow-up urine drug screens were performed by research staff using a handheld device, the Roche Test-Cup 5, which tested for metabolites of cannabis, opiates, amphetamines, cocaine, and PCP. Participants received a $30 check for completing each of the 6-month and 12-month follow-ups. The

recontact rate was 60% (n = 170) for the 6-month follow-up urine and 46% (n = 130) for the 12-month follow-up urine.

DATA ANALYSES

A number of investigators have employed cluster-analytic techniques to identify subtypes of drug abuse clients based on longitudinal patterns of change on outcome measures (e.g., Magura, Kang, Nwakeze, & Demsky, 1998; Marlowe, Festinger, Foltz, Lee, & Patapis, 2005; Morral, Iguchi, Belding, & Lamb, 1997; Prochaska, Velicer, Guadagnoli, Rossi, & DiClemente, 1991; Willis, McNamara, Vaccaro, & Hirky, 1996). Following this approach, we subjected participants' weekly urine drug-screen results to cluster analyses in SAS (Release 8.02; SAS Institute, 2001) using a disjoint method via the *K*-means procedure. This procedure places cases into mutually exclusive categories, in which the Euclidean distances between cases within a cluster are significantly smaller than the distances between cases in different clusters. Although it is common to employ Ward's method when conducting exploratory cluster analyses (e.g., Marlowe, Merikle, Kirby, Festinger, & McLellan, 2001), disjoint methods do not require cases to have complete data on all of the clustering variables. This allows for a larger percentage of the sample to be included in the cluster analyses and subsequent validation analyses. Therefore, using a disjoint method has the benefit of increasing the representativeness of the sample and enhancing statistical power for evaluating the convergent and predictive validity of the clusters.

Data analyses were limited to the first 14 weeks of the drug court programs because that is the minimum time period in which any participant could have satisfied the program requirements and graduated from a drug court program. This ensured that there would be an equivalent maximum number of data points for all study participants, including those who were abstinent from the outset and graduated at 14 weeks. Looking at urine specimens beyond 14 weeks would result in participants having different numbers of data points, which would make the analysis and interpretation of the data more difficult.

It is important to note that, in drug courts, the failure to provide a scheduled urine specimen is viewed as a separate infraction from drug use, and it often constitutes a more serious violation than providing a drug-positive urine specimen (e.g., Marlowe, 2008; Marlowe & Wong, 2008). This is because the failure to provide a scheduled urine specimen is interpreted by the drug court as an effort at deception or an indication of irresponsibility. A drug court client who fails to provide a urine specimen is thus generally assumed by the drug court to have both engaged in drug use and to have attempted to conceal the drug use or to have failed to behave responsibly by "owning up" to the drug use. Following this logic, we coded participants' urine drug-screen results on a 3-point scale, ranging from 0 to 2:

- A valid drug-negative urine specimen received a score of *2*, reflecting the fact that a urine specimen was delivered as directed and also tested negative for recent drug use;
- A valid drug-positive urine specimen received a score of *1*, reflecting the fact that a urine specimen was delivered as directed but tested positive for recent drug use;
- An unexcused missing urine specimen or invalid or tampered specimen received a score of *0*, reflecting the fact that a urine specimen was not delivered as directed and was presumed to have been drug positive.

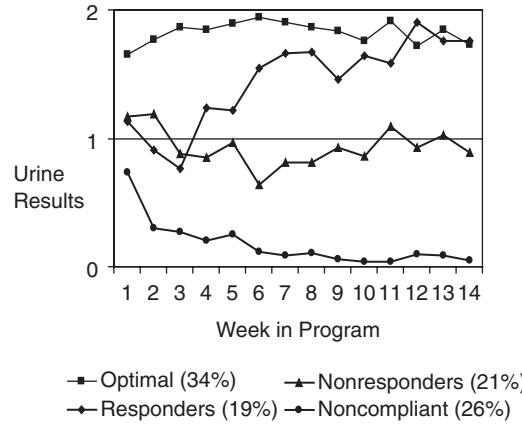

Figure 1: Mean Profiles for a Four-Cluster Solution
Note. 2 = *drug-negative urine specimen*; 1 = *drug-positive urine specimen*; 0 = *failure to provide a valid urine specimen*.

RESULTS

Analyses of the initial urine specimens provided on admission to the drug court programs revealed that 44.0% of the participants ($n = 125$) tested positive for marijuana and 9.2% ($n = 26$) tested positive for cocaine. Other drugs were rarely used, and each accounted for approximately 1% or less of the drug-positive urine specimens. It is important to note that cannabis has the longest detection window in urine, so it is possible that participants were using other drugs that were missed by the urine screens.

CLUSTERS

Four disjoint cluster analyses were performed examining between three and six possible cluster solutions. All of the cluster solutions produced an acceptable pseudo F statistic and a significant R^2. We settled on the four-cluster solution because it (a) accounted for a substantial proportion of the variance in the data ($R^2 > .75$), (b) yielded clusters that had sufficient cell sizes ($n > 50$ per cell) to conduct between-cluster comparisons, and (c) produced clusters that were all logically interpretable and potentially clinically relevant.

The mean scores for the four-cluster solution are depicted in Figure 1. The average clusters were distinctly classifiable as reflecting (a) consistently drug-negative urine specimens, (b) consistently drug-positive urine specimens, (c) consistently missed urine specimens, and (d) urine specimens that started out as drug positive but became progressively drug negative after approximately 6 weeks.

Cluster 1: Optimal performers. Of the total sample, 96 participants (34%) were classified into an average cluster characterized by consistently drug-negative urine specimens. These individuals were generally capable of achieving abstinence soon after entry into the programs and continued at that optimal level of performance over the next 14 weeks.

Cluster 2: Responders. Of the total sample, 54 participants (19%) were classified into an average cluster characterized by urine specimens that started out as drug positive but became drug negative after approximately 6 weeks in the programs. These participants were labeled as responsive because they exhibited decreased drug use after having been exposed to several weeks of the drug court interventions.

Cluster 3: Nonresponders. Of the total sample, 61 participants (21%) were classified into an average cluster characterized by consistently drug-positive urine specimens. Although these participants were generally compliant in terms of providing urine specimens when directed to do so, their performance did not improve during the initial 14 weeks of the programs.

Cluster 4: Noncompliant. Of the total sample, 73 participants (26%) were classified into an average cluster characterized by a frequent failure to provide scheduled urine specimens. These individuals generally exhibited spotty attendance, submitted invalid or tampered specimens, or absconded from the programs.

BASELINE ASI DRUG COMPOSITE SCORES

Nearly one half of the sample ($n = 129$, 46%) produced subthreshold ASI drug composite scores ($\leq .04$), similar to a community sample of non-treatment-seeking individuals. Participants classified as optimal performers were significantly more likely to produce subthreshold ASI drug composite scores (63%) compared to participants classified as responders (34%), nonresponders (40%), or noncompliant (38%), $\chi^2(3, n = 281) = 16.58$, $p < .001$.

We examined the sensitivity and specificity of the ASI, using the $\leq .04$ cutoff, for predicting membership in the optimal performers cluster. In this context, sensitivity refers to the correct identification of participants as being optimal performers (i.e., true positive rate), and specificity refers to the correct identification of participants as not being optimal performers (i.e., true negative rate). Sensitivity and specificity were both 0.63, indicating that the ASI correctly predicted membership in the optimal performers cluster roughly two thirds of the time.

BETWEEN-CLUSTER COMPARISONS

Table 1 presents between-cluster comparisons on demographic and outcome variables. The analyses focused on comparing optimal performers to the remaining participants, which is consistent with the primary goal of this project (i.e., determining if there was a subgroup of participants who achieved abstinence early in the programs and remained consistently abstinent thereafter). Prior to conducting these analyses, we determined whether there were site-by-cluster differences. Results revealed that Wilmington had a significantly lower proportion of optimal performers as compared to Dover and Georgetown, $\chi^2(2, n = 284) = 15.67$, $p = .001$. Therefore, site was entered as a covariate. The clusters did not differ by research condition, APD, or prior drug treatment, and it was therefore not necessary to control for these variables in the analyses.

TABLE 1: Between-Cluster Comparisons (Optimal Performers vs. the Other Clusters) on Demographic and Outcome Variables Controlling for Site Differences

	Optimal Performers		*Responders*		*Nonresponders*		*Noncompliant*		
	n	%	n	%	n	%	n	%	p
Total sample	96	34	54	19	61	21	73	26	
Site									.001
Wilmington	47	49	31	57	40	66	65	89	
Dover	13	14	5	9	8	13	4	5	
Georgetown	36	37	18	33	13	21	4	5	
Research condition									*ns*
As needed	39	41	29	54	31	51	35	48	
Biweekly	40	42	19	35	23	38	32	44	
As usual	17	18	6	11	7	11	6	8	
APD diagnosis	26	27	18	33	20	33	28	38	*ns*
Prior drug treatment	19	20	9	17	16	27	26	36	*ns*
Subthreshold ASI drug composite score at entry	60	63	18	34	24	40	27	38	.001
Gender									*ns*
Male	72	75	41	76	46	75	59	81	
Female	24	25	13	24	15	25	14	19	
Race									.022
African American	19	20	19	35	27	44	39	53	
Caucasian	72	75	30	56	31	51	29	40	
Other	5	5	5	9	3	5	5	7	
Age (*M, SD*)	25.85	9.27	23.91	6.18	26.11	8.76	23.78	6.46	*ns*
Years of education (*M, SD*)	12.05	1.45[a]	11.89	1.54	11.64	1.67	11.30	1.22[a]	.016
Unmarried	83	87	49	94	58	95	70	99	*ns*
Graduation rate	89	93	44	82	27	44	7	10	.001
Drug-negative urine at 6-month follow-up	34	60	17	46	18	46	7	19	.002
Drug-negative urine at 12-month follow-up	14	30	9	32	8	40	8	23	*ns*

Note. $N = 284$. APD = antisocial personality disorder; ASI = Addiction Severity Index. Values are *n* and percentage unless otherwise noted. Subthreshold ASI drug composite score = ≤ .04.
a. Optimal performers were significantly more educated than were those who were noncompliant ($p = .002$).

There were no significant differences between the optimal performers and participants in the other three clusters in terms of gender, age, or marital status. However, an omnibus ANCOVA revealed a significant difference among the clusters in terms of years of education, $F(3, 278) = 3.49$, $p = .016$, $\eta^2 = .036$, and post hoc tests revealed that the optimal performers were significantly more educated than were participants in the noncompliant cluster ($p = .002$). In addition, a significantly greater proportion of Caucasian participants were classified as optimal performers as compared to African American participants, $\chi^2(6, n = 284) = 14.74$, $p = .022$. Further analyses revealed that this difference was limited solely to Wilmington and appeared to result from the fact that there was a larger proportion of African Americans and a smaller proportion of optimal performers in Wilmington.

With regard to longer-term outcomes, participants classified as optimal performers had significantly higher graduation rates than did participants in the other clusters, $\chi^2(9, n = 254) = 128.04$, $p = .001$. As previously noted, recontact rates for the follow-up urine screens were 60% at 6 months and 46% at 12 months. There were no significant differences in follow-up rates among the clusters at either the 6-month ($p = .197$) or 12-month follow-ups ($p = .140$); therefore, it was not necessary to control for recontact rates in the between-cluster comparisons of urine results. Participants classified as optimal performers were significantly more likely to provide a drug-negative urine specimen at the 6-month follow-up, $\chi^2(3, n = 170) = 15.16$, $p = .002$. There was, however, no significant difference in urine results at the 12-month follow-up. This indicates that the optimal performers continued to demonstrate superior performance for at least 6 months after their entry into the programs. The relatively low recontact rate at the 12-month assessment might account for the lack of statistical significance.

DISCUSSION

The results of this study suggest that approximately one third of participants in three misdemeanor drug court programs might have had relatively minimal drug use problems. These individuals—classified as "optimal performers" based on their urine screen results—were generally capable of achieving abstinence soon after entering the programs and remaining continuously abstinent for most of the ensuing 14 weeks. They were also significantly more likely to test negative for drugs at the 6-month follow-up and to successfully graduate from the programs. In addition, approximately two thirds of these individuals produced subthreshold drug composite scores on the ASI, similar to a community sample of non-treatment-seeking individuals. This provides convergent evidence for the existence of a subgroup of individuals who might not have had a clinically significant substance use disorder.

As noted earlier, this finding raises a question about how to interpret success rates for drug court programs. It is possible, for example, that as many as one half of graduates were drug experimenters who were not predisposed to continue or escalate their drug use. These individuals might have relinquished drug involvement on their own, even if they had not become involved with the criminal justice system.

This does not necessarily imply, however, that these individuals were mismatched to the drug court programs. As described earlier, the programs were specifically developed for misdemeanor offenders charged with low-level offenses related to the possession of marijuana or drug paraphernalia. These preadjudication diversion programs are scheduled for a relatively brief period of 4 to 6 months and focus primarily on prevention and psychoeducation. Such a regimen could, in fact, be well suited to individuals coming into early contact with the criminal justice system. If these individuals had not been under drug court supervision, they might not have exhibited optimal performance and might have continued to abuse drugs or alcohol.

Regardless, it is possible that such individuals could have been effectively managed in less intensive and less costly programs that do not require more than 4 months of group counseling, court hearings, and weekly urine testing. Perhaps they could have been

adequately supervised by pretrial service officers or probation officers or assigned to alternative tracks within the drug court programs that had lesser service requirements (DeMatteo, Marlowe, & Festinger, 2006, 2007). Several drug courts are developing less-intensive treatment tracks for offenders with less severe drug problems, but data on the effectiveness of these tracks are not yet available. Such an arrangement could conserve scarce resources for the more serious offenders (i.e., those labeled as "nonresponsive" or "noncompliant") who may require more intensive treatment and supervision to reduce their involvement with drug abuse and crime.

It is important to note that approximately one fifth (19%) of the participants appeared to respond as intended to the drug court interventions. These individuals ($n = 54$) exhibited substantial drug involvement on entry into the drug courts and might have required several weeks of services to respond to the interventions. This is not an insubstantial proportion of individuals. Reducing substance abuse and crime among even a few dozen offenders per year could, in the long run, make meaningful contributions to public health and public safety and produce substantial cost savings for a community. The benefits achieved by this subset of "responders" could, in themselves, justify the cost and effort of the drug court programs. It is important to note that research suggests that drug courts are associated with significant cost savings over traditional criminal justice interventions (Belenko, Patapis, & French, 2005; Bhati, Roman, & Chalfin, 2008; Logan et al., 2004). Although incarceration can cost $20,000 to $50,000 per inmate per year, research suggests drug courts cost roughly $3,000 per client per year (Belenko et al., 2005). Research also suggests that drug courts are more cost effective than probation because probationers typically have multiple failed treatment experiences that are very expensive but offer little gain (see Huddleston, Marlowe, & Casebolt, 2008). Tailoring treatment to the needs of the clients could produce even more cost savings.

Nearly one half (47%) of the participants were labeled as nonresponsive or noncompliant during the first 14 weeks of the programs. This should not, however, be interpreted to mean that treatment was not effective in nearly one half of the cases. Graduation rates for these specific programs generally exceed 60% to 70% (e.g., Festinger et al., 2002; Marlowe et al., 2004; Marlowe, Festinger, Dugosh, Lee, & Benasutti, 2007) and averaged 58% across all three programs in this study. This would suggest that a substantial number of these individuals simply needed more than 14 weeks of exposure to the interventions to succeed.

The results of this study also revealed a significant relationship between baseline ASI drug composite scores and participants' performance in the drug court programs. The utility of the ASI for predicting *DSM-IV* substance dependence diagnoses has previously been established (Rikoon, Cacciola, Carise, Alterman, & McLellan, 2006), and the results of the present study suggest that ASI drug composite scores correctly predicted cluster membership for "optimal performers" more than 60% of the time. This suggests that the ASI might have practical utility for identifying low-needs drug offenders who could perhaps be managed in less-intensive programs or less-intensive tracks within the drug court programs. As a result, drug courts should consider using instruments such as the ASI to evaluate the needs of clients on entry into drug courts, which would seemingly permit the most efficient use of limited court and treatment resources.

On the other hand, the ASI produced approximately one third false negatives and one third false positives in terms of the classification of optimal performers. No measurement tool is perfectly valid and reliable, and there will often be an appreciable number of false positives and false negatives in any program. Some individuals with serious drug problems

might be erroneously assigned to low-intensity conditions, and others with mild problems might be assigned to high-intensity conditions. This requires some mechanism to be in place to adjust the initial assessment as a consequence of participants' subsequent performance in treatment. For example, if a participant continues to provide drug-positive urine specimens after having been assessed as subthreshold and placed on a low-intensity track, this should trigger a case review by the drug court treatment team to reconsider the initial disposition.

This approach, sometimes referred to as an *adaptive treatment* or *stepped care* model, has been demonstrated to improve outcomes and conserve treatment resources in community-based substance abuse treatment programs (e.g., Breslin et al., 1999; Brooner et al., 2004; Brooner, Kidorf, Stoller, Neufeld, & Kolodner, 2007; Kidorf, Neufeld, King, Clark, & Brooner, 2007; Reid et al., 2003) and has recently shown promise for improving outcomes in drug courts (Marlowe et al., 2007; Marlowe et al., 2008). Adaptive treatment models adjust the type or dose of services administered to clients based on clients' initial clinical presentation or ongoing performance in treatment (Murphy, Lynch, McKay, Oslin, & TenHave, 2007). Adaptive interventions have been shown to be effective in treating a wide range of substance use disorders involving licit drugs (e.g., tobacco) and illicit drugs (e.g., cannabis) (for a review, see Marlowe et al., 2008). Given the ASI's rates of false positives and false negatives in terms of classifying optimal performers, an adaptive treatment approach might be useful in helping programs adjust the type or dose of treatment over time. More research is needed to identify valid performance indicators for determining whether clients are demonstrating sufficient progress in drug court programs. In addition, research should focus on developing effective adaptive strategies for intervening with nonresponsive and noncompliant individuals in drug courts.

LIMITATIONS

An important limitation of this study is that it focused exclusively on misdemeanor drug offenders who were charged with relatively minor offenses and did not have serious criminal histories. It is perhaps not unexpected that a substantial proportion of such individuals would not have serious drug problems. However, national data reveal that most drug courts treat felony drug offenders, and an increasing proportion of drug courts utilize postadjudication models for repeat probation violators (Huddleston et al., 2008). It is possible that a substantially larger proportion of participants in felony drug courts or postadjudication drug courts would have more severe drug use problems. One possibility is that examining drug court clients with more severe drug problems would result in the same cluster solution found in this study but with different proportions of offenders in each cluster. Another possibility is that a different cluster solution would be obtained. Further research should be conducted in felony and postadjudication programs to determine what proportion of those populations can achieve abstinence after only minimal exposure to the clinical and supervisory interventions. Future research should also examine subtypes of clients based on the type of drug being abused. Unfortunately, in this study, there was insufficient variance in the type of drug being used, which prevented us from exploring that variable in the cluster analysis.

Because these were relatively brief programs, outcome trajectories were examined only over a 14-week interval. Some individuals who were capable of remaining sober for a few months might have relapsed later in response to new stressors or changing life circumstances. Retaining such individuals in a strict drug court program might be an effective and

cost-effective strategy over the long run, even if they are capable of abstaining from drugs on their own in the immediate aftermath of a criminal arrest. Additional research should be conducted over longer follow-up intervals to determine whether outcome trajectories remain stable for several months or even years after participants' arrests. A related point concerns the recontact rates, which were 60% at 6 months and 46% at 12 months. Although there were no significant differences in follow-up rates among the clusters at either the 6-month or 12-month follow-ups, it is possible that the recontacted participants differed in some systematic way from the participants we were unable to recontact. Future research with higher follow-up rates would be informative.

Finally, the cluster analyses were exploratory in nature and therefore might have capitalized on chance variation in the derivation sample. It is not unusual to experience "shrinkage" in the variance accounted for (i.e., R^2) by clustering algorithms when they are applied to new samples. Additional research is needed to determine whether the clusters remain stable, interpretable, and clinically useful when applied to new samples of drug court clients.

CONCLUSION

Although drug courts often report impressive graduation rates, there is little information on whether drug court graduates responded to the drug court interventions or perhaps had less severe drug problems on entry. This study found that more than one third of clients in three misdemeanor drug courts showed little evidence of having a drug use problem on entry into the drug courts, which raises important questions about how to interpret the documented success of drug courts. The results of this study have implications for how drug courts assess and treat clients. Careful screening on entry to the drug court can identify clients who have less severe drug use problems. The ASI reliably identified the "optimal performers" more than 60% of the time, and combining the ASI with other assessment approaches would likely result in an increased ability to identify low-needs clients. Moreover, an adaptive intervention approach that adjusts the intensity of treatment based on clients' performance in the drug court program might be useful in light of the ASI's rates of false positive and false negatives. These assessment and treatment approaches will help to ensure that drug court clients are receiving appropriately tailored interventions.

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