Factors That Predict Drug Court Completion and Drop Out: Findings From an Evaluation of Salt Lake County's Adult Felony Drug Court

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Available online: 04 Mar 2009

To cite this article: Audrey O. Hickert, Scott W. Boyle & Derrik R. Tollefson (2009): Factors That Predict Drug Court Completion and Drop Out: Findings From an Evaluation of Salt Lake County's Adult Felony Drug Court, Journal of Social Service Research, 35:2, 149-162

To link to this article: http://dx.doi.org/10.1080/01488370802678926

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Factors That Predict Drug Court Completion and Drop Out: Findings From an Evaluation of Salt Lake County’s Adult Felony Drug Court

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ABSTRACT. This study examined program outcomes for 133 graduates (46.2%) and 155 terminated clients (53.8%) of an adult felony drug court in Salt Lake City, Utah, in an effort to identify factors that predict program completion and drop out. Logistic regression analyses identified three factors related to drop out: depression, cocaine/stimulants as most troubling substance, and additional charges prior to drug court intake. Two factors were found to be related to completion: spending free time with family rather than with friends or alone and older age at intake. The model correctly predicted 65% of graduates and 73% of dropouts. These findings are discussed with respect to their implications for policy, practice, and future research.

KEYWORDS. Drug court, outcomes, prediction, mental health

Drug courts emerged in the late 1980s in response “to rapidly increasing felony drug caseloads that strained the nation’s courts and overflowed its jails and prisons” (National Institute of Justice [NIJ], 2006). Of the total number of inmates in 1984, the percentage of offenders imprisoned for drug-related crimes was 7.6%; by 1990 it reached a high of 22%. Since 1990 the number of drug-related offenders in prisons has stabilized at around 21% of the total prison population (Bureau of Justice Statistics [BJS], U.S. Department of Justice Office of Justice Programs, 2005).

The increase in the number of drug offenders in the system led to overcrowded court dockets, jails, and prisons (Mateyoke-Scrivner, Webster, Stanton, & Leukefeld, 2004). Because of the influx of drug offenders into the system, an administrative order from the chief judge of Florida’s 11th judicial circuit established the first drug court during the summer of 1989 to help relieve the pressure caused by increasing caseloads on the state’s judicial and corrections systems (National Institute of Justice [NIJ], 1995). As of December 2008, more than 1,950 drug courts were operating in the United States (NIJ, 2008, p. 1).

Accompanying drug courts’ rise in popularity and community support have been questions concerning whether they are effective in...
retaining offenders and in reducing drug use and criminal behavior during and after program participation. A number of studies evaluating drug courts indicate that the answer to these questions is essentially yes (Belenko, 1998, 1999, 2001). In Belenko’s 1998 study, he reported the following six conclusions: Drug courts engage and retain felony drug offenders with minimal to substantial criminal, substance abuse, and treatment histories; compared to other forms of community supervision (i.e., probation), drug courts provide closer and more comprehensive supervision; while in the drug court program, criminal behavior and drug use decline significantly; postprogram criminal behavior is lower, especially for those who graduate; reduced jail/prison time and criminal behavior, along with lower criminal justice system costs, lead to savings at least in the short term; and drug courts have successfully been able to bring together the public health/treatment systems with the criminal justice system. In Belenko’s 1999 and 2001 studies, the newer data support the earlier findings that drug courts provide more supervision; engage offenders in long-term treatment; and lower during-program criminal activity and drug use, as well as postprogram rearrest rates. Less clear is the impact on long-term recidivism rates.

The above conclusions drawn by Belenko are consistent with the New York State Adult Drug Court Evaluation conducted by Rempel et al. (2003). This 3-year study of 11 of the state’s largest drug courts concluded that drug courts lead to a reduction in recidivism for participants during and after program participation. Moreover, compared to dropouts, those who graduate from drug courts are less likely to reoffend. What’s more, retention rates for participants in drug courts during a 1-year period exceeded the retention rates for those participating in community-based treatment programs.

Recognizing the benefits that drug courts offer, research has since been directed at identifying factors associated with completion and drop out. Understanding the relationship between client characteristics and drug court completion can allow practitioners to select a target population that is most likely to benefit from the intervention, as well as tailor services for individuals who are at higher risk of program failure (Cissner & Rempel, 2005; Miller & Shutt, 2001; Roll, Prendergast, Richardson, Burdon, & Ramirez, 2005). The present study advances knowledge in these two areas by examining the relationship between a number of drug court participant characteristics and environmental factors with program participation. Specifically, participants’ age, gender, race, criminal history, education level, employment status, substance-abuse related factors, psychological problems, physical health, and family and social relationships are examined in relation to program completion and drop out.

REVIEW OF THE LITERATURE

A number of studies have attempted to identify offender characteristics that differentiate program completers from dropouts. These studies, however, have not led to a consensus among researchers concerning which factors identify persons who will succeed in drug courts (Cissner & Rempel, 2005; Roll et al., 2005). The following section summarizes study findings for nine of the most frequently studied factors.

Age

Fourteen studies have explored the relationship between participants’ age and drug court outcomes. Five studies found that the likelihood of graduation increased with age (Mateyoke-Scrivner et al., 2004; Rempel & DeStefano, 2001; Rempel et al., 2003; Wolf, Sowards, & Wolf, 2003; Young & Belenko, 2002). While Cissner and Rempel (2005) acknowledge that increased age is associated with drug court completion, they also recognize that older persons are more likely to perform well outside of drug courts. Peters, Haas, and Murrin (1999) report that program graduates in their study were slightly, but not statistically significantly, older than dropouts. In six other studies age did not differentiate graduates from dropouts (Fetros, 1998; Gray & Saum, 2005; Miller & Shutt, 2001; Roll et al., 2005; Schiff & Terry, 1997; Sechrest & Shicor, 2001). Only one study (Senjo & Leip, 2001) found a negative correlation
between age and program completion (younger offenders were more likely to graduate).

**Gender**

Eleven studies were reviewed that examined gender as a predictor of drug court retention/noncompletion. Rempel and DeStefano (2001) found that women were more likely than men to drop out during the first 90 days of program participation. However, when they controlled for the number of days until treatment began (females waited more than twice as long as men to begin treatment) the differences were no longer significant. In eight other studies, completion-retention rates did not vary significantly by gender (Fetros, 1998; Mateyoke-Scrivner et al., 2004; Miller & Shutt, 2001; Peters et al., 1999; Rempel et al. 2003; Roll et al., 2005; Sechrest & Shicor, 2001; Senjo & Leip, 2001). Young and Belenko (2002) found that males were more likely than females to be participating at 6 months, but no differences were noted at the 1-year mark. Gray and Saum (2005) found that women in their study were more likely than men to complete the drug court.

**Race**

Race predicted drug court outcomes in six studies. In their Broward County Florida drug court study, Schiff and Terry (1997) found that Whites were more likely to graduate than non-Whites. Sechrest and Shicor (2001) also reported that ethnicity appeared to play a significant role in outcomes with Whites being more likely than African Americans and Hispanics to complete the program. The authors pointed out that Whites were overrepresented in this study because the program was primarily designed for abusers of amphetamine, a drug that was predominately used by Whites. Senjo and Leip (2001) found race to be a statistically significant predictor of outcomes, with White offenders being more likely to complete than non-White offenders. Gray and Saum (2005) found that race predicted outcomes when controlling for other independent variables. Specifically, they report that Whites were more than twice (118%) as likely as non-Whites to graduate from the drug court they studied. In Miller and Shutt’s (2001) study of a South Carolina drug court, a greater percentage of White than Black participants remained in the program at 3 months and eventually graduated. Finally, Wolf et al. (2003) discovered that European Americans had lower odds of terminating from drug court; however, the odds of termination for minority participants were reduced when the race of the participant was the same as the program case manager.

In six other studies where race was examined, this participant characteristic did not differentiate completers from dropouts. Peters et al. (1999) found that ethnicity did not predict completion/attrition nor did it predict arrest during the 30-month follow-up period. Fetros (1998), Mateyoke-Scrivner et al. (2004), and Roll et al. (2005) also found no difference in graduation/drop out rates for the racial groups studied. Rempel and DeStefano (2001) found a significant bivariate racial group difference in program retention rates for the first 90 days of drug court participation, with Black participants being more likely than Latinos to complete the program. However, race was not significant when the effects of age were controlled for in multivariate analyses. Similarly, Rempel et al. (2003) found a similar bivariate relationship between race/ethnicity and graduation or drop out; however, when the effects of other factors were controlled for through multivariate analyses, the effect of race/ethnicity diminished significantly. Rempel et al. (2003) suggest that “this indicates that, in accordance with findings from earlier research, relationships sometimes uncovered between race and success may not be due to race per se, but to the correlation between race and other independent variables (e.g., age or socioeconomic status)” (p.108).

**Criminal History**

Criminal history appears to be a more consistent predictor of drop out and rearrest following drug court program participation. Two of the 12 studies that examined this factor found no significant difference in terms of prior offenses or convictions between graduates of drug courts and those who were terminated or removed (Fetros, 1998; Sechrest & Shicor, 2001). The remaining studies found a correlation between
criminal history and graduation or early termination. Specifically, Young and Belenko (2002) found that the odds of completing decreased if the participant had a more extensive criminal history, as evidenced by juvenile arrests and months spent in jail or prison. These first two factors were also related to failure at the 6-month mark. Another variable, history of weapons charges, was associated with failure at 12 months. Gray and Saum (2005) found that compared to graduates, noncompleters had twice the number of prior arrests; they also report that the odds of a participant completing the program decreased by 17.7% for every additional arrest. Wolf et al. (2003) report that participants with prior felony convictions were at increased odds of termination or failing to graduate. Having two or more prior convictions before starting drug court and having a conviction prior to starting drug use were both related to drug court failure (Miller & Shutt, 2001).

Mateyoke-Scrivner et al. (2004) found that graduates were more likely to have drug or alcohol charges than those with more probation violations or violent charges were less likely to graduate. Peters et al. (1999) found drug court graduates differed significantly from nongraduates in the number of prior arrests; graduates had an average of 2.5 prior arrests compared to 6.7 for nongraduates. Alternatively, Cissner and Rempel (2005) suggest that high-risk offenders and those “facing greater legal consequences for failing drug court” (p. 14) may benefit the most from participation because offenders with no prior criminal record are likely to succeed in both drug and conventional court. However, drug offenders, rather than property offenders, are likely to perform better in drug courts than in conventional courts.

Finally, Rempel and DeStefano (2001) report that felony convictions had no effect on completion rates for Phase I of the drug court they studied. Those with misdemeanor drug-related convictions were, however, more likely to drop out. These researchers offered an explanation for this counterintuitive finding, arguing that those with misdemeanor charges most likely suffered from a more serious addiction to drugs. Because of the seriousness of their addiction, these individuals were not entrusted with major drug sales and, thus, were not arrested for the more serious offense of drug dealing.

**Education**

Studies focusing on participants’ education levels have yielded mixed results. Six of the 10 studies found no difference between graduates and nongraduates on education level (Fetros, 1998; Gray & Saum, 2005; Rempel & DeStefano, 2001; Roll et al., 2005; Sechrest & Shicor, 2001; Senjo & Leip, 2001). In contrast, Peters et al. (1999) found that 70% of graduates had completed high school or a GED program compared to 42% of nongraduates. Schiff and Terry (1997) and Mateyoke-Scrivner et al. (2004) report finding a linear relationship between education level and completion, with Mateyoke-Scrivner et al. indicating that the odds of graduating increased by 15% for each year of education achieved. Cissner and Rempel (2005) indicate that higher socioeconomic status (as measured by education or employment) is associated with success in both drug courts and the traditional criminal justice system.

**Employment**

Findings are mixed with regard to employment status. In five studies, employment and retention or graduation were significantly correlated. Employment at the time of initial participation was the strongest predictor of drug court completion in the Roll et al. (2005) study, with employed persons being more than 14 times more likely to graduate than those who were unemployed at intake. Young and Belenko (2002) found that participants who had long stays at one job were more likely to continue in treatment for 1 year or longer. Fetros (1998) found that those who were employed full time at entry into treatment (59%) were more likely to graduate when compared with those who were unemployed (48%) and part-time employed (24%). Mateyoke-Scrivner et al. (2004) found that participants employed full time were 2.9 times more likely to complete the program than those who were not employed. Peters et al. (1999) also reported that drug court graduates were more often employed than those who dropped out.
Miller and Shutt (2001), Sechrest and Shicor (2001), and Wolf et al. (2003) were unable to predict graduation from employment status. Rempel and DeStefano (2001) found no significant relationship between employment and retention during the first 90 days of drug court treatment. These researchers hypothesized that this insignificant finding may have been attributable to the lack of variance associated with this variable in their study. The Sechrest and Shicor study may have also experienced this limitation because 84% of the participants were unemployed (79% of the graduates were unemployed vs. 91% of noncompleters).

Factors Related to Substance Abuse

Findings were more consistent when the factor of drug of choice was studied. Participants who used “harder drugs,” such as heroin or cocaine, were at higher risk for failing drug court programs compared to those who used “softer drugs,” such as marijuana. Specifically, Rempel et al. (2003) found heroin users were not only more likely than marijuana users to fail their drug court program, but were also more likely to reoffend following program participation. Rempel and DeStefano (2001) found that participants who identified heroin as their primary drug were more likely to drop out of Phase I of drug court treatment than participants who selected other drug-of-choice categories. Rempel and DeStefano were also able to predict drop-out based on heroin being the drug of choice while crack use was found to predict retention. Miller and Shutt (2001), Schiff and Terry (1997), Senjo and Leip (2001), and Wolf et al. (2003) report that participants who indicated crack or cocaine as their drug of choice were less likely to graduate than those who did not. Similarly, graduates in the Mateyoke-Scrivner et al. (2004) study were more likely to report alcohol and marijuana as their primary substance of abuse compared to nongraduates who most often used cocaine. Additionally, those participants who used cocaine during the 6 months prior to entering drug court were terminated more frequently. The Peters et al. (1999) study also reported that cocaine users were less likely to graduate than those who primarily used alcohol and marijuana. Drug of choice was significantly related to drug court outcome in Roll et al.’s 2005 study; however, once demographic variables were controlled for, the relationship between outcome and drug of choice was no longer significant. Only Fetros (1998) found no significant difference between graduates and terminated clients based on primary drug of choice. While having a less severe drug of choice is frequently associated with drug court completion, Cissner and Rempel (2005) counter that these individuals are likely to also succeed outside of the drug court setting.

In regard to substance use at the time of treatment, Sechrest and Shicor (2001) report a significant difference between graduates (17.2%) and nongraduates (34.1%) reporting marijuana use during drug court treatment. Interestingly, amphetamine and mixed drug use (heroin, PCP, cocaine, and hallucinogens) did not statistically differentiate graduates from dropouts in this study even though mixed drug use was considerably different between the two groups (12% for graduates compared to 20.5% for nongraduates). Gray and Saum (2005), on the other hand, report that the use of any drug 30 days prior to entering drug court decreased the likelihood of graduation by 6% for each drug that the participants used.

Psychological Problems

Five studies investigated the influence of psychological problems on the likelihood of completing drug court. Peters et al. (1999) found no significant differences between graduates and nongraduates on self-reported mental health problems. Similarly, Miller and Shutt (2001) did not find a significant relationship between prior mental health treatment and drug court graduation. Conversely, Young and Belenko (2002) reported that participants in their study who reported being troubled by psychological problems were more likely to have dropped out of treatment at 6 and 12 months ($p = .08$) and that those reporting a history of psychological treatment were more likely to have been terminated from treatment by 12 months. Gray and Saum (2005) found that self-reported depression predicted treatment failure whereas having been prescribed medication for psychological or
emotional problems predicted graduation. Those who reported having been depressed in the 30 days prior to drug court treatment were 55.2% less likely to complete drug court treatment; those who had been prescribed medications for the above types of problems were about 700% more likely to complete drug court when compared with those who were not prescribed medication. Gray and Saum also report that women were more likely than men to report depression, anxiety, and having been prescribed medications for psychological/emotional problems. In contrast, Roll et al. (2005) found no relationship between self-reported mental health medication and drug court outcome.

Family and Social Relationships

The studies reviewed varied greatly in the manner in which variables related to family and community ties were conceptualized and operationalized. Peters et al. (1999) found that those participants who lived alone with their children were less likely to graduate when compared to those who lived with family, friends, or alone (with no children). Sechrest and Shicor (2001) found no significant difference between graduates and noncompleters based on the number of children living with the drug court participant. However, Mateyoke-Scrivner et al. (2004) predicted from their study that married participants were 57% less likely to graduate.

Rempel and DeStefano (2001) found that participants living in more socially isolated neighborhoods were more likely to drop out. Fetros (1998) found that success in drug court was related to community ties and having children; participants with one or more ties to the community or with any number of children were more likely to complete the drug court program. In contrast, Fetros found no significant relationship between marital status (e.g., married, single, widowed, divorced, or separated) and graduation. Similarly, Roll et al. (2005) and Miller and Shutt (2001) found no relationship between marital status and drug court completion in their samples. Finally, Schiff and Terry (1997) found that drug court graduation could not be predicted by participants’ bonding and social attachment levels.

Summary

The findings summarized above suggest that considerable variation exists across studies regarding the relationship between drug court completion and client characteristics, criminality, substance abuse, psychological factors, and sociofamilial factors. Additional research is, therefore, needed if the goal of identifying the “optimal” drug court client is to be realized. The present study adds to the extant literature by examining the impact the above listed nine factor domains, plus an additional rarely studied factor domain, physical health, had on individuals who participated in a felony drug court operating in Salt Lake City, Utah.

METHODS

Research Design

We conducted a retrospective cross-sectional study using existing drug court data. Variable selection was informed by the literature review and was necessarily limited by the information contained in drug court records. In all, 10 factor domains were reviewed. Independent variables shown to have a bivariate statistical relationship with the outcome variable were analyzed with logistical regression in an effort to identify predictive models.

Sample

The sample for this study consisted of 288 participants of the Salt Lake County, Utah, adult felony drug court who participated from 2003 to 2005. Drug court intake criteria required that program participants have a current second- or third-degree felony drug plea and one of the following: a prior felony drug conviction, two prior felony drug arrests, or a significant addiction problem at the time of screening. Offenders with a history of sex offenses, violent offenses, or who were not legal residents of the United States were not allowed to participate. Just over half (55.6%, \( n = 160 \)) were male; the majority were White (90.3%). Age at intake ranged from 18 to 59, with a median of 33.4.
Just over half of the sample (53.8%, n = 155) were terminated from the drug court (drop outs) and the remainder (46.2%, n = 133) had graduated. Graduation and termination status came from official drug court records. To be eligible for graduation, participants had to complete at least 52 weeks of drug court and progress through four phases. Each phase required fewer court appearances and drug tests and less intensive substance-abuse treatment. The 133 completers had a median of 449 days in the program whereas dropouts had a median of 209 days in the program. Drug court policy stated that persons were to be terminated from the program if they had two pre-plea or three post-plea bench warrants (failures to appear in court, generally resulting from absconding from the program). Drug court guidelines for admission to the program stated that participants were to have chosen to enter a plea in abeyance after attending a 2-week pre-plea orientation.

**Data Collection and Measures**

Data were originally collected for a Substance Abuse and Mental Health Services Administration (SAMHSA)–funded evaluation of the drug court program. Participants’ demographic characteristics and outcome status were compiled from electronic drug court records. Clients’ criminal histories were queried as flat file data tables from official arrest records maintained by the Utah State Department of Public Safety. Measures of education, employment, substance abuse, physical and psychological health, and family and social relationships were drawn from participants’ responses to individual Addiction Severity Index (ASI) items. Results from the computer-administered ASI were downloaded from the drug court’s database. Computer-administered ASI composite scores and severity ratings have test-retest reliability ranging from .62 to .95 and criterion validity for the composite scores was found to be generally good (Butler et al., 2001). For this study, individual items were selected from the ASI based on face validity and similarity to individual variables examined in the literature.

Table 1 lists the 18 variables in the 10 factor domains examined in relation to participants’ drug court completion/dropout. Clients’ age, gender, and race were self-reported. Race was dichotomized into a flag for majority versus minority status. Criminal history was operationalized as total charges prior to drug court intake. This was calculated by taking the sum of each unique charge type on each arrest date that occurred prior to drug court intake.

<table>
<thead>
<tr>
<th>TABLE 1. Results of Bivariate Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at intake</td>
</tr>
<tr>
<td>Gender</td>
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<tr>
<td>Female</td>
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<tr>
<td>Male</td>
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<tr>
<td>Minority status</td>
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<tr>
<td>Minority</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Pre–drug court charges**</td>
</tr>
<tr>
<td>Years of school completed*</td>
</tr>
<tr>
<td>Days worked in 30 days prior to</td>
</tr>
<tr>
<td>drug court intake**</td>
</tr>
<tr>
<td>Days used marijuana in 30 days</td>
</tr>
<tr>
<td>prior to drug court intake*</td>
</tr>
<tr>
<td>Ever had serious withdrawal</td>
</tr>
<tr>
<td>sickness or seizures**</td>
</tr>
<tr>
<td>Most troubling substance was</td>
</tr>
<tr>
<td>cocaine/stimulants*</td>
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<tr>
<td>Any depression in 30 days prior</td>
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<tr>
<td>to drug court intake**</td>
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<tr>
<td>Any prescription for mental health</td>
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<tr>
<td>medication in 30 days prior to</td>
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<tr>
<td>drug court intake</td>
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<tr>
<td>Nights in hospital for physical/</td>
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<tr>
<td>medical problems in 30 days prior</td>
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<tr>
<td>to drug court intake*</td>
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<tr>
<td>Number of times used emergency</td>
</tr>
<tr>
<td>room services in 30 days prior to</td>
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<tr>
<td>drug court intake**</td>
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<tr>
<td>Marital status</td>
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<tr>
<td>Married</td>
</tr>
<tr>
<td>Never married</td>
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<tr>
<td>Widowed/separated/divorced</td>
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<tr>
<td>Number of children</td>
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<tr>
<td>Living situation at drug court</td>
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<tr>
<td>intake</td>
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<tr>
<td>Independent</td>
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<tr>
<td>Other (dependent, homeless,</td>
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<tr>
<td>controlled environment)</td>
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<tr>
<td>Spend most free time with**</td>
</tr>
<tr>
<td>Family</td>
</tr>
<tr>
<td>Friends</td>
</tr>
<tr>
<td>Alone</td>
</tr>
<tr>
<td>Number of close friends*</td>
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</tbody>
</table>

*p < .05. ** p < .01.
The remaining six areas: education, employment, substance abuse, psychological problems, physical health, and family and social relationships, came from individual items on the ASI. Items relating to physical health were included in the analyses because of the availability of data on the ASI. In addition, this factor domain was found to have received scant attention in previous studies. Education and employment variables were clients’ self-reported responses to the following ASI items: number of years of school completed and “In the past 30 days, how many days did you work for pay?” Substance-abuse measures included the number of days clients reported using marijuana in the 30 days prior to drug court intake, as well as if clients ever experienced serious withdrawal sickness or seizures after quitting or cutting back on substance use. Responses to the item “Which substance has caused you the most problems and led to your coming into treatment?” indicated that methamphetamine (48.6%), cocaine (22.0%), and heroin (14.0%) were the most troubling substances for clients in this sample. Each was recoded into a flagging variable and examined in a bivariate test with drug court outcome. A significantly higher percentage of graduates indicated methamphetamine as their most troubling substance ($\chi^2 = 7.24, df = 1, p = .01$), while a significantly higher percentage of terminated clients indicated cocaine as their most troubling substance ($\chi^2 = 3.869, df = 1, p = .05$). There was no difference between the groups on percentage reporting heroin as their most troubling substance.

Psychological problems were measured by clients’ self-reports on the following ASI items: experiencing any depression in the 30 days prior to drug court intake and being prescribed any medication in the 30 days prior to drug court intake for psychological or emotional problems ($0 = \text{no}, 1 = \text{yes}$, on both items). Physical health was measured by two ASI items: the number of nights clients reported being hospitalized in the 30 days prior to drug court intake for physical or medical problems and the number of times clients reported using emergency room services for any reason during the same time period.

Family and social relationships were measured through five ASI items. Client outcomes were examined by marital status and number of children. Living situation was recoded into a dichotomous variable indicating independent versus dependent status (living with relative, shelter, institution, etc.). Responses to the item “How do you spend most of your free time?” were kept in their original three categories: with family, with friends, and alone. The last item included was clients’ self-reported number of close friends.

Analyses

A series of bivariate tests were run to determine which of the 18 variables within the 10 factor domains demonstrated a bivariate relationship with the outcome variable (completion $= 0$, dropout $= 1$). Variables that reached statistical significance were subsequently included in the regression analyses (Hosmer & Lemeshow, 1989). Although all of the originally selected variables were chosen based on the existing literature and their theoretical relationship with drug court outcomes, removal of nonsignificant variables was necessary to maximize statistical power and identify the most parsimonious model. Graduates and terminated clients were compared on years of education completed using a $t$-test. The skewed distribution of the remaining continuous variables required the use of nonparametric tests. The Mann-Whitney U test was used with the following variables: age at intake, number of children, number of close friends, days used marijuana, nights hospitalized for a physical problem, and times used emergency room services for any reason in the 30 days prior to drug court intake. Due to violating an assumption of the Mann-Whitney U test that requires similarity of distribution for the two groups compared (Pett, 1997), the following variables were analyzed using the median test: pre–drug court charges and days worked in 30 days prior to drug court intake. Chi-square tests were conducted to examine differences between
Factors That Predict Drug Court Completion and Drop Out

157

Results of the bivariate tests are presented in Table 1. Means are presented for years of school completed because it was analyzed using the independent samples t test. Medians are presented for the variables analyzed using the Mann-Whitney U test and the median test; percentages are presented for the variables analyzed using chi-square statistics.

Of the 18 variables examined in bivariate tests, 11 reached statistical significance at the .05 alpha level and were, therefore, considered for inclusion in the regression analyses (see Table 1). Correlations and multicollinearity statistics (Eigenvalues and condition indices) were run for variables that could be representing the same construct (e.g., 30-day hospital stays with 30-day emergency room use). Multicollinearity statistics were not in the problematic range; therefore, none of the significant variables were excluded from the initial logistic regression analysis.

Because age at intake, gender, and minority status have been shown to moderate outcomes in previous research, these variables were also included as covariates in the first logistic regression model together with the 11 significant variables identified through bivariate tests. These 14 variables were analyzed through logistic regression using the enter method. The enter method was used because there were no a priori hypotheses about the ordering of the predictor variables. The enter method of logistic regression allows for the evaluation of the contribution made by each predictor after controlling for the other predictors (Tabachnick & Fidell, 2001). Nonsignificant predictors were removed from subsequent models, resulting in a final most parsimonious and predictive regression model containing the demographic covariates and significant predictors of drug court outcome. The sample size for the final model was \( N = 260 \) (90.3% of total study sample). No procedures were used to substitute for missing data; only cases with complete data were included in the final sample. Our analysis of cases with missing data did not reveal any patterns that would suggest systematic error.

To confirm the results of the enter method logistic regression analyses, forward and backward stepwise logistic regressions were run. The stepwise method is suggested for screening and hypothesis generation (Tabachnick & Fidell, 2001) and, therefore, was used as a confirmatory technique.

RESULTS

The present study examined 10 factors in relation to drug court outcomes and identified three variables related to drop out and two variables related to completion in the final enter method logistic regression model. Introductory bivariate tests indicated that graduated and terminated clients did not differ on age at intake, gender, or minority status (see Table 1). Terminated clients had significantly more charges prior to drug court intake (Median Test \( \chi^2 = 14.36, df = 1, p < .01 \)), while graduates had significantly more years of education (\( t(285) = 2.41, p = .02 \)). A greater percentage of graduates reported working in the 30 days prior to drug court intake (\( \chi^2 = 9.40, df = 1, p < .01 \)). More than one-third (38.2%) of the graduates reported working at least one day during that time period, compared to only 21.6% of dropouts.

Significantly more dropouts self-reported marijuana use in the 30 days prior to drug court intake (\( z = −1.97, p = .05 \)). Only 9.1% of graduates reported any marijuana use in the 30 days prior to the start of drug court, compared with 17.4% of dropouts. Other substance use items showed that a significantly higher percentage of dropouts experienced seizures or withdrawals when decreasing substance use (\( \chi^2 = 6.95, df = 1, p = .01 \)). Dropouts were also more likely to indicate cocaine/stimulants as their most troubling substance (\( \chi^2 = 3.89, df = 1, p = .04 \)). A significantly larger group of dropouts reported experiencing depression in the 30 days prior to starting drug court (\( \chi^2 = 8.66, df = 1, p = .01 \)), although the two groups did not differ significantly on the percentage that were prescribed psychotropic medications during the same time period.

Graduates and dropouts also differed significantly on hospitalizations in the 30 days prior to intake (\( z = −2.15, p = .03 \)). Only one graduate (0.8%) reported a hospitalization in the month
before starting drug court; 5.2% of dropouts indicated spending at least one night in the hospital for a physical problem. Use of emergency room services in the month prior to drug court intake was also significantly higher among dropouts, with 14.2% of them reporting use compared to 4.5% of graduates ($z = -2.77, p = .01$).

Graduated and terminated clients did not differ significantly on three of the five family and social relationship variables: marital status, living situation, and number of children. However, a significantly larger proportion of graduates indicated spending most of their free time with family members rather than alone ($\chi^2 = 13.21, df = 2, p < .01$). An approximately equal percentage of graduates and dropouts reported spending the majority of their free time with friends. On the final item, graduates reported having significantly more close friends than dropouts ($z = -2.32, p = .02$).

The first logistic regression containing the 11 significant variables from the bivariate tests and the three demographic characteristics was significant (Model $\chi^2 = 68.35, df = 15, p < .01$), indicating that the group of predictors differentiate between graduates and dropouts. The model was a good fit for the data (Hosmer & Lemeshow, $\chi^2 = 11.87, p > .05$) and the Nagelkerke pseudo-R-squared indicated that approximately 31.7% of variance in program outcome can be explained by the variables included in the model.

Significant predictors of dropout from the drug court program were as follows: having a more extensive criminal history, having cocaine or stimulants as the most troubling substance, and experiencing depression in the 30 days prior to drug court intake. Participants who indicated spending the majority of their free time with family members were less likely to be terminated from drug court. The significance of the Wald’s test for years of education and 30-day employment were below an alpha level of .10 and were also included in the second regression model. However, after eliminating the nonsignificant variables from the first model, education and employment failed to reach statistical significance in the second model.

The third, and final, enter method model contained only the independent variables that were significantly related to drug court outcome, as well as the demographic covariates. Table 2 displays the variables included in the final enter method logistic regression, their coefficients, Wald’s statistics, significance levels, and odds ratios (Exp (B)). The final model was significant (Model $\chi^2 = 51.33, df = 15, p < .01$) and accounted for approximately 24% of variance in drug court outcome. The Hosmer and Lemeshow test had a value of 11.76 ($p > .05$), indicating that the model fit the data reliably. This third and final model improved classification from 55% in the constant-only model (which indicates the percentage expected to be correctly classified by chance) to 69.6% by correctly predicting 65% of graduates and 73.4% of terminated clients. Odds ratios indicate that clients who reported depression in the 30 days prior to drug court intake were nearly three times more likely to drop out than those who did not. Clients who indicated cocaine or stimulants as their most troubling substance that brought them to treatment were more than twice as likely to drop out as clients who indicated another substance. Each additional criminal charge prior to entering drug court was associated with an 8% increase in likelihood of termination from the program. Clients who indicated spending the majority of their free time with family members, as opposed to with friends or alone, were two-thirds less likely to drop out of the program. Lastly, age at intake reached statistical significance in the final model, with older

### TABLE 2. Final Logistic Regression Model of Drug Court Termination, Enter Method

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Wald</th>
<th>p</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at intake</td>
<td>-0.03</td>
<td>4.06</td>
<td>0.04</td>
<td>0.97</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.21</td>
<td>0.55</td>
<td>0.46</td>
<td>0.81</td>
</tr>
<tr>
<td>Minority status</td>
<td>0.06</td>
<td>0.02</td>
<td>0.89</td>
<td>1.06</td>
</tr>
<tr>
<td>Pre–drug court charges</td>
<td>0.07</td>
<td>20.56</td>
<td>0.00</td>
<td>1.08</td>
</tr>
<tr>
<td>Most troubling substance</td>
<td>0.83</td>
<td>5.73</td>
<td>0.02</td>
<td>2.30</td>
</tr>
<tr>
<td>was cocaine/stimulants</td>
<td>0.83</td>
<td>5.73</td>
<td>0.02</td>
<td>2.30</td>
</tr>
<tr>
<td>Any depression in 30 days prior to drug court intake</td>
<td>1.01</td>
<td>10.41</td>
<td>0.00</td>
<td>2.73</td>
</tr>
<tr>
<td>Spend most free time with</td>
<td>-1.10</td>
<td>7.88</td>
<td>0.00</td>
<td>0.33</td>
</tr>
<tr>
<td>Family</td>
<td>-0.77</td>
<td>3.21</td>
<td>0.07</td>
<td>0.46</td>
</tr>
<tr>
<td>Friends</td>
<td>-0.77</td>
<td>3.21</td>
<td>0.07</td>
<td>0.46</td>
</tr>
<tr>
<td>Constant</td>
<td>0.77</td>
<td>1.42</td>
<td>0.23</td>
<td>2.16</td>
</tr>
</tbody>
</table>
Factors That Predict Drug Court Completion and Drop Out

clients being slightly less likely to be terminated from the program.

Results from the backward and forward stepwise logistic regression analyses, which were conducted as confirmatory tests, generally supported the results of the most parsimonious enter method model. The backward stepwise regression resulted in four significant variables, all of which were also significant in the final enter method model (prior charges, cocaine/stimulants, depression, and free time). The forward stepwise model resulted in four significant variables, three of which were shared with the final enter method model (prior charges, depression, and free time; education was the fourth). The consistency of results across the confirmatory tests indicates the strength of these variables in predicting drug court completion and drop out.

DISCUSSION

Our findings suggest that when demographic variables are controlled for, those felony drug court clients who are most likely to fail drug court are those with psychological/mental health problems, specifically depression; those for whom stimulants are the most troubling substance; those who spend the majority of their free time alone or with friends rather than family; those who have more extensive criminal histories; and those who are younger. These findings are consistent with the findings of previous studies.

Psychological Problems

In the case of psychological problems, our results mirror those of Young and Belenko (2002) and Gray and Saum (2005) who report a link between psychological problems and early termination. Unlike Gray and Saum (2005), however, we, as did Roll et al. (2005), did not find that taking medications decreases the likelihood of early termination. Our finding that participants’ self-reported depression was associated with a nearly three times greater likelihood of dropping out suggests the need for drug courts to pay attention to their clients’ mental health challenges, especially mood disorders. Programs should consider conducting mental health screenings as part of the preprogram assessment protocol along with referrals to in-house or appropriate mental health providers for clients determined to be struggling with psychological problems. Future research should continue to explore the benefits of providing these services. Moreover, given the link between mental health problems and addiction (see Martin, Weinberg, & Bealer, 2006) and the relationship Rempel and DeStefano (2001) discovered between severity of addiction and drug court failure, researchers should continue to study how these variables interact to inhibit drug court success.

Factors Related to Substance Abuse

Our results are consistent with those of Mateyoke-Scrivner et al. (2004), Miller and Shutt (2001), Peters et al. (1999), Schiff and Terry (1997), Senjo and Leip (2001), and Wolf et al. (2003), who report that participants whose drug of choice is crack cocaine or cocaine were less likely to graduate than those who selected other drug-of-choice categories such as marijuana or hallucinogens. Drug courts should concentrate on developing strategies for retaining clients who prefer stimulants, that is, crack cocaine, cocaine, and any derivatives of amphetamines. Researchers should assist programs in this effort by studying the impact of drug of choice on drug court outcomes.

Family and Social Relationships

We found that participants who spend the majority of their free time with family are less likely to terminate early than those who spend free time alone or with friends. This finding is consistent with the research of Peters et al. (1999) who concluded that participants who lived alone with their children (no other adults in the home) were less likely to graduate when compared to those who lived with family, friends, or alone (with no children). Rempel and DeStefano (2001) and Fetros (1998) also found that social connectedness related to positive outcomes. Drug courts might achieve better results through emphasizing the importance of support systems and incorporating them into their program. Future
research should attempt to discover how and why support systems are helpful so that drug courts and their participants can benefit from this knowledge.

**Criminal History**

Similar to Gray and Saum (2005), Mateyoke-Scrivner et al. (2004), Miller and Shutt (2001), Peters et al. (1999), Wolf et al. (2003), and Young and Belenko (2002), we found that drug court clients with lengthier criminal histories are less likely to graduate. Given the frequency of this finding in the literature, drug courts might improve their effectiveness and efficiency by giving priority to first-time offenders over those with more lengthy criminal histories. On the other hand, Cissner and Rempel (2005) note that lower-risk offenders are more likely to be successful in a range of programming and that more intensive programs such as drug courts should be reserved for the higher-need offenders. Researchers can also aid programs in this effort by identifying the types of previous crimes that might place a client at substantially higher risk for dropout and examining interventions that are effective with high-risk participants. For example, interventions that are structured, focused on behavior, and emphasize skill acquisition, such as cognitive behavioral therapy (CBT), are most effective with offenders (Lipsey, 1995). One model, moral reconation therapy (MRT), is specifically designed for working with offenders and has empirical support for its effectiveness (Little & Robinson, 1996; Little, Robinson, & Burnette, 1993). Research should examine the substance abuse treatment models and behavior change strategies employed by drug courts.

**Age**

Consistent with the findings of Cissner and Rempel (2005), Mateyoke-Scrivner et al. (2004), Rempel and DeStefano (2001), Rempel et al. (2003), Wolf at al. (2003), and Young and Belenko (2002), we also found that younger participants were more likely to drop out. As is the case with criminal history, this finding is also frequently reported in the literature. Drug courts, therefore, should develop strategies for retaining younger offenders. Such strategies might include more frequent judicial review and more intense supervision on the part of drug court personnel.

**Education**

Education was not a significant predictor in our final enter regression model but was significant in the confirmatory forward stepwise model. We conclude that years of education and age at intake overlap one another substantially and that age, by virtue of its significance in the enter model and confirmatory backward stepwise model, is the more stable predictor whereas years of education is likely a function of age. This finding is consistent with that of Fetros (1998), Gray and Saum (2005), Rempel and DeStefano (2001), Roll et al. (2005), Sechrest and Shicor (2001), and Senjo and Leip (2001), who did not find a link between education and termination/graduation.

**Employment**

Employment at intake did differ significantly for graduates and terminated clients in the bivariate test, but failed to reach statistical significance in the multivariate analyses. Limited variance (low employment among all drug court participants) may have contributed to this finding. The literature is also split on this issue, with five studies indicating that employment is significantly related to drug court outcomes (Fetros, 1998; Mateyoke-Scrivner et al., 2004; Peters et al., 1999; Roll et al., 2005; Young & Belenko, 2002), and four studies suggesting that there is no relationship (Miller & Shutt, 2001; Rempel & DeStefano, 2001; Sechrest & Shicor, 2001; Wolf et al., 2003). However, two of the four (Rempel & DeStefano, 2001; Sechrest & Shicor, 2001) also had samples with limited variance on this measure. Drug courts seek to divert offenders from incarceration and promote productive lifestyles; additional research is, therefore, warranted on this issue.

**Physical Health**

Physical health did not emerge as a predictor of graduation/termination in any of our models. This finding, however, might be the result of the lack of variation that exists for this
Factors That Predict Drug Court Completion and Drop Out

variable; the vast majority of the sample did not report physical health problems. This factor merits additional attention from researchers given that health problems are more prevalent among illicit drug users.

Race

A relationship between graduation/termination and race was not identified—a finding that is contrary to the findings of half of the studies reviewed (Gray & Saum, 2005; Miller & Shutt, 2001; Schiff & Terry, 1997; Sechrest & Shicor, 2001; Senjo & Leip, 2001; Wolf et al., 2003), but consistent with findings reported by the other half (Fetros, 1998; Mateyoke-Scrivner et al., 2004; Peters et al., 1999; Rempel & DeStefano, 2001; Rempel et al., 2003; Roll et al., 2005). As was the case with physical health, a lack of variance may account for this finding given that the vast majority of our sample was White. Given this limitation and the conflicting findings reported in the literature, drug courts should not discount the potential significance of race in determining program outcomes. Moreover, researchers should continue to explore the relationship between program outcomes and race-related factors, such as the inclusion of ethically sensitive practice and the inclusion of case managers from diverse racial/ethnic backgrounds.

Gender

As has been the case in the majority of studies that have examined the relationship between gender and graduation/termination (Fetros, 1998; Mateyoke-Scrivner et al., 2004; Miller & Shutt, 2001; Peters et al., 1999; Rempel et al., 2003; Roll et al., 2005; Sechrest & Shicor, 2001; Senjo & Leip, 2001), we did not discover an association between these variables. However, because the findings in the literature are inconsistent, with Young and Belenko (2002) reporting better retention for males at 6 months while Gray and Saum (2005) report that women were more likely to complete drug court, researchers should continue to explore how gender and gender-specific treatment might impact drug court outcomes. For example, Rempel and DeStefano (2001) noted that gender differences disappeared when examined in the context of different treatment availability for men and women.

Strengths and Limitations

Our study has a number of strengths and limitations associated with it. The strengths include a relatively large sample and our analytic method that controlled for client characteristics known to influence drug court outcomes when building predictive models, which increased our understanding of the “real” impact other factors have on outcomes. Additionally, we examined the understudied factor, physical health. Limitations associated with our study include the lack of variation in the racial/ethnic make-up of our sample and the relatively large number of amphetamine users in our sample—both of which may limit the generalizability of our findings. Other threats to validity such as maturation and history, which are typical of studies that utilize archival data, also exist. Furthermore, we were limited in the types of analyses that could be conducted because of the use of archival data for this study.

CONCLUSION

We believe drug courts can apply our findings in practical ways to increase client retention by creating admission policies to ensure that those most likely to benefit from program services and scarce resources are given priority in admissions decisions and tailoring supervision and services to engage and retain higher-risk offenders. Our study, which correctly predicted 65% of graduates and 73% of terminated clients, also indicates the need for additional research leading to improved predictive models, which programs can utilize to increase their effectiveness and efficiency.

REFERENCES


