

The Effect of Drug Use, Drug Treatment Participation, and Treatment Completion on Probationer Recidivism*

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In Press:

Journal of Drug Issues

*This project was supported by Grant # 02-BD-BX-0017 awarded by the Bureau of Justice Assistance, Office of Justice Programs, U.S. Department of Justice, through the Illinois Criminal Justice Information Authority. Points of view or opinions contained within this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice or the Illinois Criminal Justice Information Authority.

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The prevalence of drug use among the probationers, and the entire offender population, has been well documented. Numerous drug treatment modalities have been shown to reduce recidivism among this population; however, analyses of programmatic success are often based on offenders who complete treatment. Less is known about individuals who fail to complete treatment. The goal of the current study is to consider the interaction of drug use, drug treatment provision, and treatment completion on recidivism using data from the 2000 Illinois Probation Outcome Study. Findings from a series of proportional hazard models indicate that probationers who failed to complete treatment were more likely to be rearrested in the four years following discharge from probation, even when compared to individuals who needed treatment but did not enroll. Moreover, probationers who failed to complete treatment had more serious criminal histories and fewer ties to society. The research has important implications for the measurement of treatment provision in studies of recidivism, in specific, and more generally for the need to engage and retain probationers in drug treatment.

Keywords: recidivism, drug use, drug treatment, probation

Running Head: Treatment Completion and Recidivism

Introduction

The prevalence of drug use among probationers has been well documented. A national study of adult probationers, conducted in 1995, revealed that two-thirds of respondents used drugs at some point in their lives and nearly half were under the influence of drugs or alcohol at the time of their arrest (Mumola & Bonczar, 1998). In a comparison study of Illinois residents and probationers, Lurigio and colleagues (2003) found that probationers were two and one half times as likely to report lifetime illicit drug use, with half of the probationer population reporting illicit drug use in the past month. In addition, 43 percent of probationers were diagnosed, using criteria from the DSM-III-R, as drug dependent compared to 13 percent of the total population. The scope of the problem broadens when one considers that probationers represent approximately 60 percent of the total correctional population. Nationally, one in 54 adults is currently serving time on probation, and approximately 143,871 adults are being supervised on probation in Illinois (Glaze & Bonczar, 2006).

A number of drug treatment modalities have been developed to address drug use among probationers. A growing body of empirical evidence suggests that drug treatment provided in the community can work (MacKenzie, 1997); however, there has been substantial variation in outcomes among programs finding the most success. Client completion of the program is a frequently cited source of variation in treatment outcomes (Hser, Evans, Huang, & Anglin, 2005; Dwayne Simpson, 2004; Simpson, Joe, & Rowan-Szal, 1997). Yet, little is known about the factors that best differentiate the long-term recidivism outcomes for probationers who entered and dropped out of drug treatment from those who completed the entire course of treatment. Considering recidivism outcomes of treatment dropouts separately from completers will likely yield greater understanding of the efficacy of mandated drug treatment for probationers, and will assist researchers and practitioners in determining barriers to treatment completion.

Drug Use, Drug Treatment, and Probationer Recidivism

A correlation between drug use and criminal behavior has been well documented; however, the direction of its causation and its application to all types of drug users across all levels of addiction has

been disputed (Chaiken & Johnson, 1998). That noted, there is substantial evidence that drug use, or an arrest for a drug offense, furthers the chances for probationer recidivism (De Li, Priu, & MacKenzie, 2000; Hepburn & Albonetti, 1994; Olson & Lurigio, 2000; Visher, Lattimore, & Linster, 1991). For example, Olson and Lurigio (2000) found that probationers with a history of drug abuse were twice as likely to violate their probation or have it revoked and 60 percent more likely to be arrested for a new crime while on probation when compared to individuals without a history of drug abuse. Research by De Li and colleagues (2000) revealed that probationers who reported drug use were three times as likely to be involved in property crime.

Empirical studies documenting the relationship between community-based drug treatment and recidivism have been widespread. Most recent studies have been state-level evaluations focused on assessing the deterrent effect of specific drug treatment modalities on recidivism (Austin, Robinson, Elms, & Chan, 1999; Hearnden, 2000; Sinha, Easton, & Kemp, 2003; Vito, Wilson, & Keil, 1990). In their study on probationers and parolees, Vito and colleagues (1990) found that those who successfully completed a generalized drug treatment and testing program were less likely to be reincarcerated for technical violations compared to those who left the program prematurely or did not participate in the program. In addition, Sinha et al. (2003) found that generalized drug treatment did deter future criminality among probationers, but the effect was much stronger for older adult probationers. More recently, there have been a number of studies that illustrate the effectiveness of drug treatment when provided under the supervision of a drug court (Belenko, 2001; Gottfredson, Najaka, & Kearley, 2003).

However, not all program evaluations have linked drug treatment to reduced chances of recidivism. For example, Wagoner and Piazza (1993) found no difference in the gravity of criminal involvement between drug abusers on probation who were in group therapy and attending Cocaine Anonymous meetings when compared to a group who were only involved with Cocaine Anonymous. Hepburn and Albonetti (1994) found that drug treatment and monitoring did not affect the likelihood or timing of failure for probationers. Deschenes and colleagues (1995) also found no difference in arrest levels or drug use between drug abusers randomly assigned to drug court and those on regular probation.

Similarly, in reviewing 15 community-based outpatient treatment programs for adult drug offenders, Chanhatisilpa and colleagues (2001) found that programs that included only monitoring, control, or supervision in the community did little to deter chemically dependent offenders; however, programs that included a therapeutic community component with extended aftercare did reduce the chances of recidivism (see also MacKenzie, 1997; Petersilia & Turner, 1991).

Some of the variation in the efficacy of programming can be linked to variation in treatment fidelity, effective treatment matching, and length of participation. The assumption is that individuals who participate in long-term programs, and complete the full course of treatment, have greater opportunity to break the cycle of dependency with a minimum of three to nine months of treatment being ideal (Gendreau, 1996). Fewer studies, however, have paid specific attention to the outcomes of program completers and dropouts among a sample of offenders mandated to treatment. This is an important omission that warrants further investigation because researchers estimate that nearly half of all individuals who enter a drug treatment program do not complete the full course of treatment (Boynum & Kleinman, 2002).

The research that has been conducted to date on drug treatment participation and completion does reinforce the importance of modeling outcomes for program dropouts separate from program completers. For example, in a study of a drug offender treatment and diversion program in Arizona, Hepburn (2005) observed a 43 percent recidivism rate for individuals who entered the program but did not complete it compared to 22 percent of those that completed the program and 52 percent who declined participation. Similarly, Gottfredson and colleagues (2003), in a study of a Baltimore drug court, documented a 57 percent rearrest rate for individuals who completed the program, while participants who entered the court but did not complete treatment and the control group had rearrest rates of 75 and 81 percent respectively.

In sum, researchers have documented a strong link between drug use and recidivism, but the research on the relationship between drug treatment and probationer recidivism is mixed. However, the majority of research in this area has not separated treatment completers from non-completers or has omitted dropouts completely, potentially masking some of the variation in the recidivism measure.

Extant research has also largely been based on short-term follow up studies conducted in limited geographic areas. Research that has considered recidivism patterns for probationers who drop out of treatment suggests that this group warrants additional research (Hepburn, 2005). More specifically, research is needed to ascertain the factors associated with recidivism and treatment non-completion. This type of analysis is useful in crafting program modalities that address barriers to treatment.

The current research was designed to bridge some of the gaps in the literature by exploring the effect of drug use and drug treatment on the incidence and timing of recidivism among a sample of probationers four years following discharge from probation. This work significantly extends the existing literature by examining how participating in and completing drug treatment affects the relationship between drug use and crime. In addition, characteristics of program completers and drop outs are contrasted to better understand the unique needs of individuals who fail to complete treatment.

Method

Data

Data for this project were obtained from the 2000 Illinois Probation Outcome Study (see Adams, Olson, & Adkins, 2002). The study was designed to provide detailed probationer-level data to support program and policy development in the state, and the project sample includes all probationers discharged from supervision in the State of Illinois from October 30 through November 30, 2000. In total, the final data set includes 3,017 individuals.¹ Data for the study were collected through a questionnaire, designed by the Illinois Criminal Justice Information Authority, and administered by probation officers in each county. The questionnaire was designed to capture information of probationer demographic characteristics, offender behavior while on probation, sentencing and case outcomes, and recidivism. Data on probationer demographic characteristics are obtained from probationers' self-reports; while, information on drug use and treatment, criminal histories, and probation outcomes come from official court documentation and probation records. In addition, arrest data are gleaned from state-level criminal justice records to help understand recidivism in the four years following discharge from probation.

Study Site

Illinois is one of five states in which the local judiciary is responsible for the management of offenders sentenced to probation (The American Correctional Association, 2000).² The Illinois Supreme Court's Administrative Office of the Illinois Courts (AOIC) provides administrative and partial financial support for the 70 single- or multi-county probation departments in the state. Operational support and management of probation is carried out by Illinois' county units of government.

The provision of treatment services is also decentralized and varies across the state, but most departments employ some form of intensive supervision probation for drug using clients that includes greater office contact, contacts and searches in the field, mandated group or individual counseling, and frequent, random drug testing. The majority of probation departments follow the three-tiered supervision system that has been implemented in Cook County. Under this model, offenders begin probation at the maximum level which includes bi-weekly contact with the probation officer and monthly office visits. Probationers monitored under medium supervision are visited every six months and have monthly contact with the probation officer; minimum security requires only four contacts with the probation department each year. Like most states and jurisdictions, localities are responsible for contracting with local services providers for treatment; therefore, the nature and intensity of treatment provided varies by department and even by individual.

Statistical Analyses

The analyses proceed in three phases. In the first phase, logistic regression is used to estimate the effect of drug use on the likelihood of a new arrest for any crime or a drug crime, net of demographic characteristics, criminal history, and current offense. This portion of the analysis was designed to broaden the existing recidivism literature by using a large sample of probationers discharged from a large Midwestern state. In addition, Cox proportional regression models are estimated to ascertain the effect of drug use on time to arrest for any crime or a drug-related crime (Allison, 1984; Cox, 1972).

The second phase of the research was designed to differentiate the effect of drug use, drug treatment provision, and treatment completion on recidivism. Similar to the initial models, logistic regression is used to estimate the likelihood of a new arrest, while survival models consider the timing of subsequent arrests. Unlike the initial models, this phase includes a series of dichotomous variables that designate the relationship between drug use, need for drug treatment, treatment provision, and treatment completion.⁴ Finally, a logistic regression model is estimated to better understand the relationship between offender demographic characteristics, nature of the offense, probationer criminal history, and failure to complete the drug treatment program.

Measures

Recidivism serves as the dependent measure and is quantified using two dichotomous variables including *new arrest* (1=arrest for any new offense; 0=no arrests) and *new drug arrest* (1=arrest for new drug offense; 0=no drug arrests) that designate arrests in the four years subsequent to discharge from probation.³ In addition, two measures capture *time to failure* and reflect the length of time, in days, until an individual was arrested for a new crime, or drug-related charge, for offenders who had at least one new arrest during the four-year follow-up period. A description of variables included in the analyses can be found in Appendix A.

Drug use, provision of treatment, and treatment completion are the primary independent variables included in the model. A dichotomous measure of *drug use* is included in the initial models and is based on formal assessments made by court staff (1= individual has a history of drug use; 0= no history of drug use). In addition, a series of dichotomous measures are included in the final models to ascertain the need for drug abuse services, the treatment response to those needs, and treatment completion. Probationers with a history of drug use were separated into three groups including individuals who: did not receive drug treatment (*No Treatment*), were referred to drug treatment but did not complete it (*Did Not Complete Treatment*), and participated and completed the course of drug treatment (*Completed Treatment*).

Individuals who did not report drug use, and were not offered drug treatment, serve as the reference category.

Indicators of criminal history and current offense are also incorporated in the models. Measures of the *number of prior convictions* for any crime and a dichotomous indicator of *prior drug arrests* (1=prior arrest for drug crime; 0=no prior drug arrests) are included. In addition, number of *arrests on probation* is included to account for negative behavior on probation. Characterizations of the current offense include *days on probation* and a dichotomous measure of *drug offense* (1=individual served probation on a drug-related offense; 0=served probation for a personal, property, or other type of offense).

Finally, a series of demographic influences were included in the models as controls and include: *age* (in years), *race* (1=Black; 0=White, Other race), *ethnicity* (1=Hispanic; 0=Non-Hispanic), *employment* (1=full-time or part-time), *education* (in years), *gender* (1=male; 0= female) and *supervision setting* (1=urban; 0=residence in a rural area).

Results

Sample Characteristics

Descriptive statistics by drug use history are displayed in Table 1. Drug use was prevalent among the study sample with 64 percent of the sample reporting drug use prior to their sentence on probation. As important, most offenders with a history of drug use (72 percent) received drug treatment while on probation, and most (71 percent) completed the full course of treatment. In contrast, 29 percent of probationers with a drug use history did not receive drug treatment.

The probationer sample included primarily young, under-educated males living in urban areas. The majority (64 percent) of probationers reported previous drug use and many were rearrested in the four years following discharge from probation. Overall, 45 percent of the sample was rearrested for any offense and 18 percent were rearrested for a drug-related offense. Contrary to expectations, bivariate analyses revealed that probationers with prior drug use were no more likely to recidivate or to fail more quickly; however, drug use was significantly associated with a new drug arrest.

Consistent with previous research, individuals with drug use histories were significantly more likely to be black, older, less educated, and living in an urban environment. They were also more likely to have had a prior drug arrest, prior conviction, and to have been arrested while on probation. In addition, these probationers were more likely to have been serving probation for a drug related offense. The two groups were not significantly different in respect to ethnicity, employment, and marital status.

--Insert Table 1 About Here--

The Effect of Drug Use on the Likelihood and Timing of Recidivism

Contrary to the bivariate analyses, results from the multivariate logistic regression models suggest that probationers who had a history of drug use were significantly more likely to be arrested following discharge from probation. As displayed in Table 2, probationers with a history of drug use were 1.21 times more likely to be arrested in the four years following discharge from probation and 1.31 times more likely to be arrested on a drug-related charge. In addition, probationers with a criminal history involving drug arrests were more likely to recidivate at all (odds=1.29) and to be rearrested for a drug crime (odds=1.83). Finally, probationers who were serving time for a drug-related offense were 1.66 times more likely to be arrested for a subsequent drug crime, but the nature of the current offense did not influence overall chances for recidivism.

Consistent with past research, probationers who were younger, male, or had a number of prior criminal convictions were most likely to recidivate. In addition, employment had a particularly strong effect on recidivism with employed persons 32 percent less likely to be arrested for any crime and 42 percent less likely to be arrested for a drug crime. The length of the probation term and the probationer's marital status did not affect the probability of recidivism.

As hypothesized, probationers who were arrested for a new crime while on probation were more likely to be arrested subsequent to discharge from probation. Individuals arrested once were 1.28 times more likely to be arrested for any offense and 1.23 times as likely to be arrested for a drug offense. The number of prior convictions was significantly related to general recidivism, although the effect was small

(odds=1.10), and the relationship between prior convictions and drug arrests did not achieve statistical significance. In addition, county of residence was a strong indicator of recidivism with individuals living in urban counties 1.18 times more likely to be arrested in general and 2.17 times more likely to be arrested for a drug related offense.

Race and ethnicity also played a significant role in the models estimated. Black probationers were 1.66 times more likely to be arrested for any crime, but the relationship was not significant in the estimates of recidivism for drug offenses. Conversely, Hispanic probationers were no more likely to be arrested for any offense, but were 30 percent less likely to be arrested for a drug offense. Although the research findings provide further insight into the relationship between drug use and recidivism, they explain little model variation as evidenced by the Nagelkerke R^2_L of .15 for the new arrest and .19 for the drug arrest model.

In addition, a series of Cox proportional hazard models were estimated to consider the relationship between drug use and timing of a new arrest or drug arrest. The positive coefficient for the drug use measure, in the new arrest and drug arrest models, indicates that probationers who used drugs failed (or recidivated) more quickly than individuals who were not users, net of demographic characteristics, criminal history, and nature of the current offense. Prior drug-related arrests were associated with accelerated recidivism outcomes, but the nature of the current offense was unrelated to the timing of a new arrest. In contrast, the drug charge measure significantly accelerated the timing of a new drug arrest, and the size of the coefficients suggests that the relationship was moderately strong. For both models estimated, younger offenders, urban dwellers, and individuals who were rearrested while on probation recidivated more quickly. Marriage also delayed the timing of a new drug arrest but was not significant in the new arrest model. In the new arrest model, men, black probationers, and individuals with prior convictions failed more quickly, but these measures did not have a significant effect on the timing of drug arrests.

--Insert Table 2 About Here--

Need for Treatment, Treatment Provision, Treatment Completion, and Recidivism

To further explore the effect that drug treatment provision and completion has on recidivism, three dichotomous variables were substituted for the general measure of drug use presented in the initial models. Probationers who did not report using drugs, therefore were not eligible for drug treatment, and were considered the reference category.

The results of the logistic regression and survival analyses presented in Table 3 are consistent with prior research suggesting that drug treatment can reduce recidivism. However, simply entering treatment does not improve outcomes. In fact, drug using probationers who failed to complete treatment were the most likely to recidivate with dropouts nearly two times more likely to be arrested for any crime following discharge from probation and 1.69 times more likely to be arrested for a drug crime. In comparison, probationers who had used drugs but did not receive any treatment were 1.42 times likely to be arrested for a drug crime and 1.25 times as likely to be arrested overall. In total, 37 percent of individuals who completed treatment had a new arrest, while 67 percent of dropouts and 53 percent on the non-treatment group were rearrested. Moreover, 12 percent of probationers who completed treatment had subsequent arrests for drug-related offenses compared to 28% of dropouts, and 25% of the no treatment group.

Although the research findings provide further insight into the relationship between drug use, treatment provision, and recidivism, they explain little model variation as evidenced by the Nagelkerke R^2_L of .16 for the new arrest and .19 for the drug arrest model. In addition, disaggregating the drug use and treatment measure did not affect the original relationships between demographic characteristics, criminal history, current offense and recidivism observed in Table 2.

--Insert Table 3 About Here--

The differences in new arrest timing for any crime between treatment groups are presented in the cumulative survival distribution displayed in Figure 1, and coefficients from the Cox proportional hazard models are presented in Table 3. Probationers who had a history of drug use, attended treatment but did not complete the full course were the most likely to recidivate and the likelihood increased steadily over time. Probationers who did not complete treatment had a recidivism rate of 33 percent at one year, 50

percent at two years, and 67 percent at year four. In contrast, the cumulative survival curves for the non-drug use and treatment completion groups were nearly identical. The recidivism rate for the non-drug use group was 20 percent at 1 year, 31 percent at two years, and 44 percent at the end of the study; while individuals who completed the full course of treatment had recidivism rates of 12 percent, 23 percent, and 37 percent at one, two, and four year follow-up periods. Finally, probationers who used drugs but did not receive services had high rates of failure; however, the cumulative survival curve was not as precipitous as the failure to complete treatment group. The no treatment group had a 27 percent failure rate at one year and failure rates of 39 percent and 53 percent at year two and four.

--Insert Figure 1 About Here--

The relationship between treatment provision and timing of a new arrest was also considered (see Figure 2). As displayed, probationers who entered treatment but failed to complete it had the most precipitous recidivism rates with 12 percent of the group with a new drug arrest within six months and 24 percent within two years. Similarly, ten percent of the no treatment group recidivated within six months and 21 had a new drug arrest within two years. The failure rates for the no drug use and treatment completion groups were not significantly different; however, some of the variation in the survival distributions may have been reduced because of the small sample size. In total, three percent of probationers who completed treatment recidivated in the first six months and eight percent had a new drug arrest within two year.

--Insert Figure 2 About Here--

Predictors of Treatment Failure

The final goal of the analysis is to better understand the differences between treatment successes and dropouts. As such, descriptive analyses were conducted and logistic regression models were estimated for the sub-group of probationers who had drug use histories and were enrolled in drug treatment (n=1385). As presented in Table 4, individuals who were serving time for a drug crime or had a prior drug arrest were more likely to fail to complete treatment. Marriage and employment were

positively associated with treatment completion. In total, 73 percent of individuals who completed treatment maintained employment, and this group was nearly two times as likely to be married.

---Insert Table 4 About Here---

In order to further differentiate treatment completers and drop outs, offender characteristics, offense history, and the nature of the current offense were regressed on treatment failure outcomes. Results from the multivariate logistic regression confirm that of the bivariate analysis. Probationers with more extensive criminal histories had the highest treatment failure rates. For example, individuals serving time for a drug offense were 1.5 times more likely to drop out of treatment. Employment also increased the chances of program completion with employed probationers 75 percent less likely to drop out of treatment; marriage did not achieve statistical significance in the multivariate model. Black, less educated, and younger probationers also had higher failure rates. On the whole, the variables explained a moderate amount of variation in the outcome as evidenced by the Nagelkerke R^2_L of .31.

Conclusions

The purpose of the current study is to examine differences in post-discharge arrest rates among a sample of probationers discharged from probation in Illinois in 2000. Consistent with national estimates, drug use is prevalent among probationers in Illinois. In total, 64 percent of the sample had a drug use history, and this group was more likely to be rearrested and to fail more quickly while on probation. The majority (71%) of probationers with a drug use history, however, received treatment and most (71%) completed treatment and were successfully discharged from probation.

More specifically, the research was designed to consider if drug treatment participation and completion further affected the relationship between drug use and recidivism. As hypothesized, probationers who completed the full course of drug treatment were the least likely to recidivate; yet, probationers who completed treatment were no more successful than individuals without a history of substance use. Even more, probationers who failed to complete treatment were more likely to fail than individuals who needed treatment but did not receive it. The results suggest that drug treatment can deter

but only if participants are able to complete the full course of treatment. Enrollment in drug treatment is not a necessary or sufficient condition for understanding the long-term patterns of recidivism.

Although the study results are intriguing, several caveats are in order. First, the measures of association presented for the estimated models suggest that there is unobserved heterogeneity that is not being considered in the model. One factor not considered in the current analysis is offender motivation for change. Although common to research of this type, the current study was not able to separate the correlation between the desire for change and the motivation to complete the program from the program itself. Sample members were mandated to treatment, but they did not come to probation as blank slates. Pre-existing differences in peer networks, criminal involvement, and educational and personal deficits may explain drug use, motivation for treatment, and recidivism. Longitudinal studies of offenders that capture pre-existing differences and incorporate measures of treatment motivation are warranted.

Second, the available research data lacked measures of the magnitude of substance use among probationers and the length, fidelity, and intensity of treatment programming. Individuals with more serious drug problems are more likely to fail; however, the dichotomous measure of drug use used in this study does not capture the nature or magnitude of drug addiction. In addition, it may be that certain forms of drug treatment programming may be more effective for probationers. The length or intensity of programming may also have affected the outcomes; however, it was impossible to ascertain the dosage of the treatment programs given the available data. Variation in treatment provision is quite common in research of this type, even in those programs that were designed to be quite rigorous (Gottfredson et al., 2003; Petersilia & Turner, 1991). Researchers should strive to develop rigorous research assessments that capture the variation in treatment between programs (see Lowenkamp, Latessa, & Smith, 2006). Doing so, would help practitioners better understand the depth of drug dependence, assist matching offenders with services, and develop standardized models of programming.

Despite the limitations of the current models, the research has important implications for policy. First, most probationers who participated in the study and had a history of drug use received and completed treatment. Consistent with prior research, mandated treatment represents a viable manner in

which to provide treatment to probationers (Hiller, Knight, Broome, & Simpson, 1998; Maxwell, 2000; Young & Belenko, 2002). What is not known is what aspect of coerced treatment is most effective in enticing offenders to complete treatment; however, researchers have suggested that legal pressure can be viewed either as a precursor to internalized desire or a catalyst with minimal internalized desire to change (De Leon, 1988; Wild, Newton-Taylor, & Alletto, 1998). Overall, there is substantial evidence that individuals who undergo treatment mandated by the criminal justice system do as well or better than voluntary clients, but it remains important to determine which facets of treatment are most effective in reducing recidivism.

The results of the research also highlight the importance of employment in understanding recidivism and treatment completion. Employment has consistently been linked to reduced chances for recidivism (Sampson & Laub, 1993; Uggen, 1999). Employment offers offenders structure, gives them something to lose, and can provide social capital. The social support derived from employment and other social relationships may help overcome barriers to treatment, as well as increase the personal and social costs of offending. Alternately, researchers have documented the negative effects that drug use has on sustaining employment and family relationships (Laub & Sampson, 2003). In fact, most qualitative studies of recidivism have reported a substantial entanglement between substance use, poor social relationships, and repeat offending (Maruna, 2001; Sampson & Laub, 1993; Zamble & Quinsey, 1997). Developing treatment programs that include a work component or facilitate gainful employment may increase the chances of treatment completion and reduce opportunities for recidivism.

Second, the research findings underscore the importance of keeping program participants enrolled and interested in the program for as long as possible. The salience of treatment completion may also weigh the utility of program expulsion for technical violations. A few jurisdictions have used short jail terms as an alternative to reincarceration with moderate success (see Gottfredson et al., 2003). Unfortunately, this research was unable to delve into barriers to drug treatment retention, such as transportation, childcare, and other everyday hassles that have been shown to hamper participation in programs (Boyle, Polinsky, & Hser, 2000; Wolf & Colyer, 2001). Because offenders often come into

custody with deficits in multiple domains (e.g., medical, psychiatric, employment, and family problems), it is important to address the co-occurring problems that may hamper treatment completion. The elevated recidivism and treatment failure rates among male, minority, and young probationers also signal the importance of understanding the treatment barriers for this group.

Overall, the study findings reinforce the importance of drug treatment for the probationer population. More importantly, the utility of separating treatment completers from non-completers in the discussion of research findings is highlighted. Failure to consider the outcomes of program dropouts can introduce significant biases into program evaluations. Researchers need to continue to understand and document programmatic failure as dropping out of a program can have significant implications for estimations of cost savings and recidivism, as well as, program replication. Understanding program failure helps us to understand not only 'what works,' but what works best and for whom and under what circumstances.

Appendix A: Description of Variables

Variable	Description
<u>Dependent Measures</u>	
New Arrest	A dichotomous variable with respondent arrested for any new offense subsequent to discharge from probation = 1; 0 = respondent was not arrested for any new offense
New Drug Arrest	A dichotomous variable with arrest for a new drug offense subsequent to discharge from probation = 1; 0 = respondent was not arrested for any new drug offenses
Time to Failure – New Arrest	The total number of days between discharge from probation and new arrest for any crime
Time to Failure – Drug Arrest	The total number of days between discharge from probation and new arrest for a drug crime
<u>Demographic Characteristics</u>	
Male	A dichotomous variable with 1 = male; 0 = female
Black	A dichotomous variable with 1 = black; 0 = white
Hispanic	A dichotomous variable with 1 = Hispanic; 0 = Non-Hispanic
Age	Age in years
Years of Education	Education in years
Employed	A dichotomous variable with 1 = fulltime or part time employment; 0 = not employed
Married	A dichotomous variable with 1 = married; 0 = not married
Urban Supervision Environment	A dichotomous variable with 1 = urban; 0 = residence in rural area (county population under 50,000)
<u>Criminal History</u>	
Prior Convictions	Number of prior convictions for any crime
Prior Drug Arrest	A dichotomous variable with 1 = prior arrest for drug crime; 0 = no prior arrest for drug crime
Arrests on Probation	Number of arrests while on probation
<u>Current Offense</u>	
Sentence Length	The total number of days on probation before discharge
Drug Charge	A dichotomous variable with the respondent serving probation on a drug- related offense = 1; 0 = individual served probation for a personal, property, or other type of offense
<u>Drug Use and Treatment</u>	
Drug Use	A dichotomous variable with the respondent having a history of drug use = 1; 0 = no history of drug use
No Drug Use (reference)	
No Treatment	A dichotomous variable with probationers who have a history of substance use but did not receive substance abuse treatment = 1
Did Not Complete Treatment	A dichotomous measure with probationers who received substance abuse treatment but did not complete it = 1
Completed Treatment	A dichotomous variable with probationers who participated and completed the course of the substance abuse treatment = 1

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Figure 1. Survival Distribution of Time to New Arrest

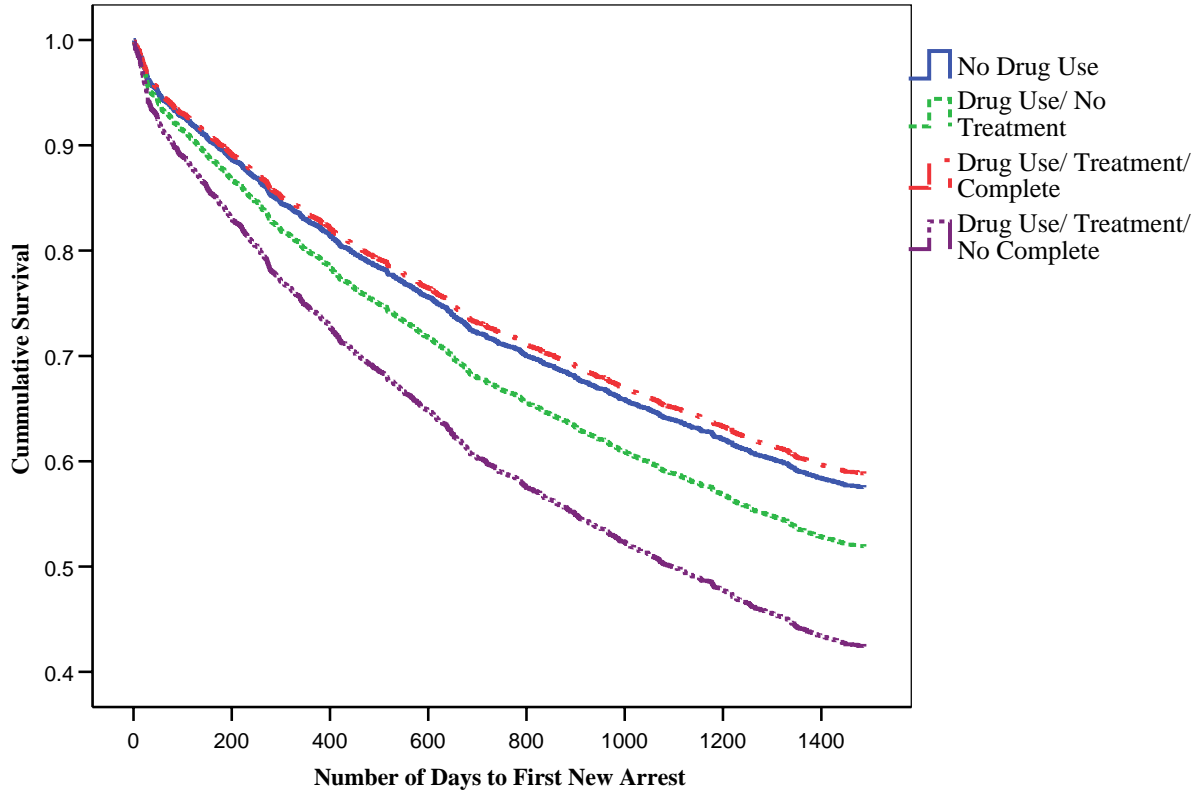


Figure 2. Survival Distribution of Time to New Drug Arrest

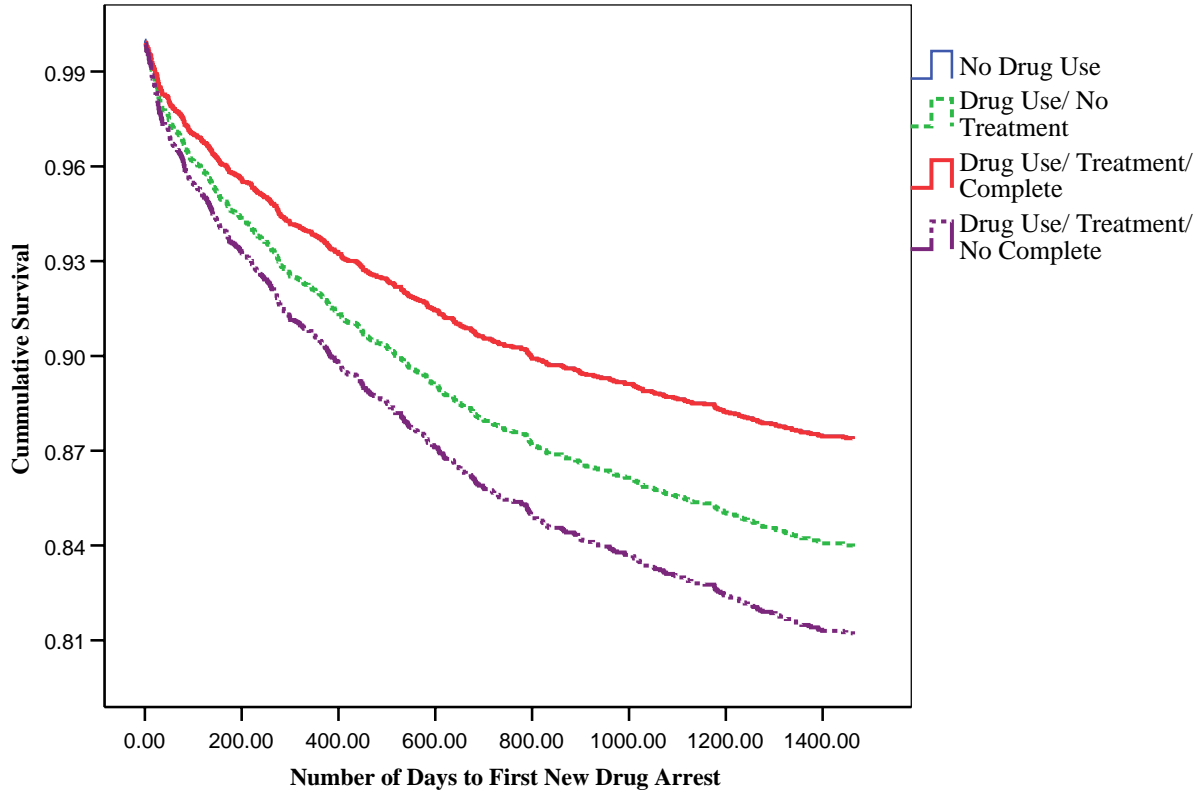


Table 1: Descriptive Statistics for the Total Sample and by Drug Use Status

	Total Sample N = 3,017	Drug Use N = 1,934	No Drug Use N = 1,083
<u>Dependent Measures</u>			
New Arrest	45%	48%	44%
New Drug Arrest*	18%	19%	16%
Time to Failure – New Arrest (mean days)	526.66 (419.728)	515.24 (413.54)	560.66 (431.69)
Time to Failure - Drug Arrest (mean days)	1301.94 (436.47)	1291.95 (444.30)	1319.78 (421.74)
<u>Demographic Characteristics</u>			
Male*	80%	81%	78%
Black***	35%	41%	32%
Hispanic	27%	13%	15%
Age (mean years) ***	30.77 (10.71)	31.39 (10.54)	29.66 (10.93)
Years of Education (mean)*	11.63 (2.02)	11.57 (1.95)	11.75 (2.06)
Employed	59%	59%	59%
Married	24%	23%	25%
Urban Supervision Environment***	52%	58%	49%
<u>Criminal History</u>			
Prior Convictions (mean)***	1.40 (2.20)	1.57 (2.31)	1.11 (1.97)
Prior Drug Arrest***	21%	23%	17%
Arrests on Probation (mean) ***	.50 (.93)	.55 (.97)	.41 (.83)
<u>Current Offense</u>			
Sentence Length (mean days)	1235.59 (4497.13)	1300.43 (4758.69)	1119.80 (3987.08)
Drug Charge***	24%	28%	16%
<u>Drug Use and Treatment</u>			
No Drug Use (reference)	36%	--	--
No Treatment	18%	29%	--
Did Not Complete Treatment	13%	21%	--
Completed Treatment	33%	51%	--

Note: Drug use and no drug use groups are significantly different at ***p< .001, **p< .01, *p< .05 (two-tailed tests)

Standard deviations for continuous variable means are presented in parentheses

Table 2: Logistic Regression and Survival Analysis of Demographic Characteristics, Criminal History, Current Offense, and Drug Use on Probationer Recidivism

Variable	New Arrest			Drug Arrest			Time to Failure – New Arrest			Time to Failure – Drug Arrest		
	<u>b</u>	<u>s.e</u>	<u>Exp(b)</u>	<u>b</u>	<u>s.e</u>	<u>Exp(b)</u>	<u>b</u>	<u>s.e</u>	<u>Exp(b)</u>	<u>b</u>	<u>s.e</u>	<u>Exp(b)</u>
Intercept	1.08***	.30	2.94	-.39	.41	.68						
<u>Demographic Characteristics</u>												
Male	.26**	.10	1.29	.20	.14		.20**	.07	1.22	.18	.12	
Black	.50***	.10	1.66	.20	.13		.36***	.07	1.43	.18	.11	
Hispanic	.09	.13		-.36*	.19	.70	.08	.10		-.30	.17	
Age	-.04***	.00	.96	-.04***	.01	.96	-.03***	.00	.97	-.04***	.01	.96
Years of Education	-.15	.10		-.07*	.03	.93	-.04**	.01	.96	-.06*	.03	.94
Employed	-.38***	.09	.68	-.54***	.11	.58	-.28***	.06	.76	-.48***	.10	.62
Married	-.15	.10		-.28	.15		-.12	.08		-.28*	.14	.76
Supervision Environment	.16	.09		.78***	.12	2.17	.20**	.06	1.22	.71***	.11	2.04
<u>Criminal History</u>												
Prior Convictions	.09***	.02	1.10	.03	.03		.06***	.01	1.06	.02	.02	
Prior Drug Arrests	.26**	.10	1.29	.61***	.12	1.83	.20**	.06	1.22	.52***	.10	1.69
Arrests on Probation	.25***	.05	1.28	.20***	.05	1.23	.13***	.03	1.14	.17***	.04	1.18
<u>Current Offense</u>												
Sentence Length	.00	.00		.00	.00		.00	.00		.00	.00	
Drug Charge	-.05	.10		.51***	.12	1.66	-.05	.07		.38***	.10	1.47
<u>Drug Use</u>												
Drug Use	.19*	.08	1.21	.27*	.11	1.31	.14*	.06	1.15	.22*	.10	1.24
Chi-Square, x df	362.25, 14			361.63, 14			397.96, 14			394.27, 14		
-2 Log Likelihood	3803.99			2464.30			21247.14			8503.21		
Negerlkerke pseudo-R ²	.15			.19								
Cox & Snell pseudo R ²	.11			.11								

***p< .001 **p< .01 *p< .05 (two-tailed tests)

Table 3: Logistic Regression and Survival Analysis of Drug Use, Treatment Participation, and Treatment Completion on Probationer Recidivism

Variable	New Arrest			Drug Arrest			Time to Failure – New Arrest			Time to Failure – Drug Arrest		
	<u>b</u>	<u>s.e</u>	<u>Exp(b)</u>	<u>b</u>	<u>s.e</u>	<u>Exp(b)</u>	<u>b</u>	<u>s.e</u>	<u>Exp(b)</u>	<u>b</u>	<u>s.e</u>	<u>Exp(b)</u>
Intercept	.98***	.30	2.66	-.47	.41							
<u>Demographic Characteristics</u>												
Male	.25*	.10	1.29	.20	.14		.19**	.07	1.21	.17	.12	
Black	.47***	.10	1.60	.16	.13		.33***	.07	1.40	.15	.11	
Hispanic	.09	.13		-.36*	.19	.70	.08	.10	1.08	-.29	.17	
Age	-.04***	.00	.96	-.04***	.01	.96	-.03***	.00	.97	-.04***	.01	.96
Years of Education	-.05*	.02	.95	-.07*	.03	.94	-.04*	.01	.97	-.06*	.03	.95
Employed	-.30***	.09	.74	-.48***	.11	.62	-.22***	.60	.81	-.43***	.10	.65
Married	-.14	.10		-.26	.15		.11	.08	.89	-.26	.14	
Supervision Environment	.18*	.09	1.20	.78***	.13	2.17	.22***	.06	1.24	.72***	.11	2.05
<u>Criminal History</u>												
Prior Convictions	.09***	.02	1.09	.02	.03		.05***	.01	1.05	.02	.02	
Prior Drug Arrests	.25*	.10	1.28	.60***	.12	1.82	.19**	.06	1.21	.51***	.10	1.67
Arrests on Probation	.23***	.05	1.26	.19***	.05	1.21	.12***	.03	1.13	.16***	.04	1.18
<u>Current Offense</u>												
Sentence Length	.00	.00		.00	.00		.00	.00	1.00	.00	.00	
Drug Charge	-.08	.10		.48***	.12	1.62	-.08	.07	.93	.36***	.10	1.43
<u>Drug Use and Treatment</u>												
No Treatment	.22*	.11	1.25	.35*	.14	1.42	.17*	.08	1.19	.26*	.12	1.30
Did Not Complete Treatment	.68***	.13	1.97	.52***	.16	1.69	.44***	.08	1.55	.02	.13	
Completed Treatment	-.02	.10		.04	.14		-.04	.07	.96	.44**	.13	1.55
Chi-Square, x df	388.87, 16			370.70, 16			438.84, 16			379.20, 16		
-2 Log Likelihood	3777.38			2455.23			21211.31			8124.21		
Negerlkerke pseudo-R ²	.16			.19								
Cox & Snell pseudo R ²	.12			.12								

***p< .001 **p< .01 *p< .05 (two-tailed tests)

Table 4. Descriptive Statistics for Probationers Who Enrolled in Treatment. Multivariate Logistic Regression of Treatment Failure

	Failed to Complete Treatment (n=397)	Complete Treatment (n=988)	Treatment Failure Logistic Regression (n=1385)		
	<u>Mean</u>	<u>Mean</u>	<u>Coeff.</u>	<u>s.e.</u>	<u>Exp(b)</u>
<u>Dependent Measures</u>					
New Arrest**					
	67%	37%			
New Drug Arrest**					
	28%	12%			
Time to Failure- New Arrest (mean days)**	816.53 (583.20)	1161.63 (496.84)			
Time to Failure – Drug Arrest (mean days)**	1169.13 (541.44)	1383.37 (329.70)			
<u>Demographic Characteristics</u>					
Male	81%	81%	.21	.18	
Black**	43%	20%	.62*	.17	1.87
Hispanic**	10%	16%	-.05	.25	
Age (mean years)**	29.59 (9.73)	33.36 (10.86)	-.04*	.01	.96
Years of Education**	11.26 (1.82)	11.78 (2.28)	-.09*	.04	.92
Employed**	33%	73%	-1.40*	.14	.25
Married**	16%	31%	-.32	.18	.73
Urban Supervision Environment**	43%	47%	.08	.16	
<u>Criminal History</u>					
Prior Convictions (mean) **	2.26 (2.68)	1.36 (2.17)	.11*	.03	1.12
Prior Drug Arrest**	30%	19%	.18	.16	
Arrests on Probation (mean)**	.92 (1.19)	.37 (.81)	.31*	.07	1.36
<u>Current Offense</u>					
Sentence Length (mean days)**	1840.85 (6447.48)	918.37 (3044.79)	.00*	.00	1.00
Drug Charge**	35%	19%	.39*	.16	1.47
-2 Log Likelihood				1320.30	
Negerlkerke pseudo R ²				.31	
Cox & Snell pseudo R ²				.22	

* p<.05 (two-tailed test)

** Treatment completer and non-completer groups statistically different at p<.05.

Note: Standard deviations for continuous variable means are presented in parenthesis

¹ Recidivism data were not obtained for 347 individuals in the original data set; therefore, they were omitted from the sample. Subsequent analyses revealed that these persons were not significantly different from the total sample in respect to drug use, demographic characteristics, and criminal history.

² The local judiciary is responsible for the administration of probation in Arizona, California, Illinois, Indiana, and Kansas.

³ Drug related arrests include a variety of different offenses including: sales, possession, trafficking, manufacturing, and delivery of a controlled substance.

⁴ To ensure the validity of all the models estimated, tests for multicollinearity were conducted. Variance inflation factors were less than 1.5, which indicates little cause for concern regarding multicollinearity (Fox, 1991).