Effects of Length of Time in Treatment and Criminal Classification Level on Recidivism Following Residential Treatment Programs for Drug Offenders

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(ABSTRACT)

One aim of residential drug treatment programs for drug offenders released from prison is to reduce recidivism rates for these offenders. However, research on this topic has shown mixed results on the effectiveness of such programs, and all of the factors that influence whether an individual will recidivate are still unclear. This study explored the relationship between criminal classification levels of drug offenders and the length of time spent in residential treatment and the effects that this relationship had on drug offenders' odds of recidivism. Data from case history records of drug-involved offenders in Florida from 1991 to 1997 were analyzed to determine whether the length of time in treatment reduced these offenders' odds of recidivism, whether offenders convicted of a felony 1 level offense were more or less likely to recidivate compared to those convicted of a felony 2 or 3 level offense, and whether there was an interaction effect of length of time in treatment and criminal classification level on offenders' odds of recidivism. Binary logistic regression analysis shows that the more time a drug offender spends in residential treatment, the higher the offender's odds of recidivism; drug offenders convicted of a felony 1 level offense were less likely to recidivate than offenders convicted of a felony 2 or 3 level offense; and that there was no interaction effect of length of time spent in treatment and criminal classification level on drug offenders' odds of recidivism.

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I.   **Statement of the Problem**

The purpose of this study is to explore the relationship between multiple criminal classification levels of drug offenders sentenced to post-prison residential drug treatment and the comparative effects that time spent in treatment has on their likelihood of recidivating. Research on recidivism among drug offenders is important because they are a large part of the population of offenders being placed in and released from prison. Consequently, we need to make more of an effort to deter these offenders from recidivating, so we must first find out what can be done to accomplish this. This research will contribute to the literature that currently exists by investigating more of the relationship between time spent in treatment and recidivism by taking criminal classification level into account.

With the increase in the prison population in recent years, problems surrounding the release of prisoners back into the community have become increasingly important in the fields of sociology and criminology. Drug offenders are a large part of this group, and recidivism among this group is one problem that still needs to be addressed. In response to this growing group of drug offenders, a variety of treatment programs are now available. However, while existing research finds such programs to be effective, more research is needed to determine the comparative effectiveness of different modes of treatment for reducing recidivism (MacKenzie 2006:265). To do this, it is also important to determine whether the treatment programs now being used are providing effective results for all criminal classification levels of drug offenders.

Data for this study were taken from "Evaluating Recidivism Among Drug Offenders in Florida's Residential and Non-Residential Substance Abuse Treatment Programs, 1991-1997" collected by Linster and Lattimore (1999), and will be an expansion on the research conducted by Linster (1999) using the same data. This study will be rooted in a positivist approach to theory

verification, which included statistical analysis of the comparative effectiveness of residential

treatment at reducing recidivism across criminal classification levels of drug offenders.

II.   Review of the Literature

Much research has been conducted concerning the problems of drug offenders in the prison system, recidivism and desistence among such offenders, and the effectiveness of treatment programs currently available. The following literature review describes what theories exist, what research has already been conducted and the findings of such research, as well as what questions are still left to be answered. The theories and empirical research outlined in the following sections will serve as a theoretical foundation for this study.

A. Drug Offenders In and Out of Prison

Before discussing what happens when prisoners are released from prison, it is important to remember that the prison population itself has increased dramatically in recent years and many of those in prison are drug offenders. Since the 1980s, the number of drug offenders sent to prison has increased to ten times the size it was before (Blumstein and Beck 2005:50). This change did not happen on its own. Mackenzie (2006:35) points out that research has found that the rates of drug offenders in prison increased much more than they would have due to changes in the demographic composition of the country alone. However, the change coincided with the crackdown on drug offenders starting around the same time. Between 1986 and 1988 the Anti-Drug Abuse Acts were passed as part of the War on Drugs (Mackenzie 2006:13). With drug offenders being targeted, it stands to reason that more would be caught and sent to prison. While there has been debate on whether this was necessary, there are definite consequences that have emerged as a result. Such consequences include the incarceration of more drug abusers, including property offenders with drug abuse problems (Males 2007). As a result, these changes in the prison population have set the stage for the emergence of a group of offenders at a high

risk of recidivating. Research on such individuals is necessary for developing effective methods of preventing recidivism.

Fairness in sentencing policies may also have an impact on drug offenders in the future, making drug offenders an important topic in policy decisions. There has been some question on whether certain drug sentences are appropriate for the crimes committed. Theorists adapting this idea have suggested we readapt the justice model of sentencing and corrections. This model concentrated on the problems in sentencing and corrections in the past, and recommended changes in sentencing policies now to ensure that they are fair and just (Mackenzie 2006:10). This population is becoming especially important now as drug sentencing policies are being reviewed and modified. This could lead to another dramatic increase in drug offenders being released from prison, making the need for assistance much greater than it is even now.

Because there are so many drug offenders in prison and most of them will be released eventually, one concern of many criminologists is the release of these prisoners into the community and their re-adaption to mainstream society. Since 1999, those prisoners who were incarcerated during the War on Drugs have become an increasingly larger percentage of those who are released from prison (Petersilia 2003). Those individuals could benefit from appropriate assistance once they are released. Once individuals have been involved in the criminal justice system, some theorists believe that their chances of offending in the future increase. According to Lemert's (1951) labeling theory, once an individual is labeled as deviant or criminal, other people react to the individual differently which decreases the individual's legitimate opportunities. When a drug offender is sent to prison, they are officially labeled by the criminal justice system, often making it more difficult for the offender to gain legitimate employment and social acceptance after their release from prison. Thus, such an individual may turn to the

subculture of deviance where opportunities are more open. Involvement in such a subculture advances deviant behavior and can lead to even harsher sanctions (Lemert 1951:275). Ultimately, Lemert (1951) claims that the individual adopts the deviant or criminal label that has been given to him or her, and criminal behavior can increase as a result. The effect this has on those sent to prison is one reason why these individuals need assistance.

Southerland and Cressy's (1924) theory of differential association can also be used to explain how involvement in the criminal justice system can lead to increased offending. This theory emphasizes how interactions and associations with deviant peers can lead to an increase in favorable definitions of deviant or criminal behavior (Southerland and Cressy 1924). Individuals placed in prison are surrounded by other individuals who may define criminal behavior as desirable. Offenders can adopt these favorable definitions and learn more about criminal behavior because of the opportunity to associate with individuals who find criminal behavior to be favorable. Southerland and Cressy's (1924) principle of differential association states that delinquent behavior is a result of having more definitions of criminal behavior as favorable, than definitions of criminal behavior as unfavorable. It is very possible for offenders in prison to build up their favorable definitions of criminal behavior to the point that they continue to offend after they are released. Therefore, with such a large increase of drug offenders in prison and being released it should be clear that this is a population within the prisons that needs to be focused on to decrease their favorable definitions of crime.

In addition to these problems putting offenders at risk of recidivating, many other problems are also associated with prisoner release into the community. One such problem is that those being released are returning to communities that lack stability and the ability to provide certain social services, including rehabilitation programs, to assist these individuals (Seiter and

Kadela 2003:380). This puts the released offenders at a higher risk of reoffending due to a lack

of assistance in the community. In addition, at the time of release from prison many prisoners

may experience high levels of stress, making it more difficult for those individuals to not return

to drug abuse habits, which is why the time just following prison release is so critical for

reducing reoffending (Seiter and Kadela 2003: 367). It is especially important now to ensure that

such drug offenders are prepared for their release and that they are monitored after their release

in an effort to help them re-adapt to mainstream society. Helping individuals when they are

released may be one way that the criminal justice system can attempt to prevent those drug

offenders from returning to prison for the same or any other offense.

     B. Recidivism and Drug Offenders

     The topic of recidivism has received much attention lately as a problem with the criminal

justice system, yet we still do not know all of the reasons why individuals continue to commit

crimes after their release from prison. In empirical research, there have been many studies with

varying definitions of recidivism depending on the type of research being conducted. It is

therefore important for the sake of clarity to note what definition of recidivism is being used and

why it was chosen. In previous research, definitions of recidivism include being convicted of a

new offense, any new arrest with conviction, the return to jail for an offence after they have

received treatment for it, or simply the return to prison for any reason (Wormith, Althouse,

Simpson, Reitzel, Fagan, and Morgan 2007:880). In a later section, we will discuss how

recidivism will be measured for this study.

     Many theories exist which address why individuals recidivate or desist from criminal

behavior. First, Hirschi's (1969) control theory of delinquency addresses why some individuals

are more likely to commit crime than others. Hirschi (1969) hypothesizes that an individual's

propensity to commit crime is tied to the strength and type of social bonds (attachment,

commitment, involvement, and belief) that the individual has. Involvement speaks to the extent

to which an individual has the opportunity to commit crime because the more involved an

individual is in legitimate activities, the less opportunity he or she will have to be involved in

illegitimate or illegal activities. Social bonds that come from having a job or getting married are

also aspects of involvement, because they are circumstances that take up the individual's time

and attention and decrease their time and desire for illegitimate opportunities.

Another theory on the topic of why individuals recidivate comes from theorists

Gottfredson and Hirschi's (1983) hypotheses for studying age and crime distributions. These

include the hypothesis that the age and crime relationship is invariant with a peak in offending

occurring at younger ages and then criminal activity decreasing as the individual ages

(Gottfredson and Hirschi 1983). This can be taken to mean that individuals tend to keep

recidivating once they are released from prison if they are released before the age where they

have matured out of criminal activity. However, Gottfredson and Hirschi's theory is not without

criticism because it is questionable whether or not the age-crime curve is actually invariant. In a

longitudinal research study on men released from prison by Sampson and Laub (2003), the

research shows that there are differences in when individuals stop recidivating, while they do

agree that most criminals do eventually desist. Therefore, we cannot be sure exactly when any

particular individual will desist from criminal activity. In addition, Sampson and Laub (2003)

argue that the changes over the life course that influence offenders to stop committing crimes are

changes in opportunities as the individual ages, in addition to macro-level events and agency of

the individual. Thus, a treatment program that also decreases the opportunity to commit crime

may have a similar effect by encouraging the individual to stop their criminal behavior. Residential treatment programs in particular act as one method of decreasing criminal opportunities for offenders after their release from prison.

It is virtually impossible to discuss recidivism without discussing desistance because the two concepts are intrinsically linked. Just as there are several definitions of recidivism that have been considered in the past, there is also a question of how to define desistence. While recidivism requires the presence of some criminal activity that can be identified, desistence is the absence of such an activity or event which makes it all the more difficult to define. According to Maruna (2001), the two ways to approach defining desistence that have been used in the past are desistence of a termination event and desistence as a maintenance process. Maruna (2001) suggests that thinking of deviance as a maintenance process is more useful because it asks the question of how an individual is able to maintain desistence despite life's obstacles and frustrations, widespread social stigma, limited career opportunities, and social exclusion (Maruna 2001). This maintenance can be done in two ways. First, as was mentioned earlier, desistence can be maintained when the offender ages out of criminal behavior through the maturation that occurs over the life course, and second, it can be maintained through the formation of social bonds, such as having a job or getting married (Maruna 2001). Thus, this may begin to explain how individuals are able to desist with the help of strengthening their social bonds.

In addition, just as there are factors that influence whether an individual will recidivate, there are similar factors that are associated with desistance. Gaining legitimate employment, forming significant life partnerships, becoming a parent, age, motivation, fear or injury or death, extent of prior offending, and finding a religious faith, among others, have all been found to be associated with the decision to desist (Ferrall and Calverley 2006:4). Thus, such factors should

be taken into account when studying recidivism so that the effect of such factors does not influence the supposed effectiveness of treatment.

C. Treatment Programs for Drug Offenders

To target the population of drug offenders in prison and being released from prison, treatment programs have been used in an effort to reduce recidivism rates and promote change within the offenders. Of all the programs available to the prison population, drug-abuse treatment is the most common form of treatment available (Wormith et al. 2007). However, the question of "what works?" still remains at the forefront of research on recidivism. This is because, with a variety of treatment programs available, there is still inconsistent evidence on what forms and methods of treatment actually work at reducing recidivism. In fact, the question of what works has become more complicated as Prendergast, Anglin, and Wellisch (1998:121) ask, "What works…for which types of offender, under which conditions, and which settings?" Wormith et al. (2007) pose a similar set of questions, proposing that in the future answers to "for whom does it work, when does it work, and how does it work" will become much more clear. The aim of this study is to contribute to the dialogue involved in answering such questions.

Some of the answers to these questions may be found in existing research on evaluating treatment programs, of which there are several differing analyses available. For example, three studies on aftercare treatment following the Therapeutic Community (TC) program in prison all showed that the post-release treatment was critical in maintaining gains from the TC program and in assisting the offenders in the transition from the prison back into the community (Wormith et al. 2007). However, this does not really answer the question of how well the treatment programs are working. McGuire's (2002:13) meta-analyses of studies on treatment for

offenders and recidivism show an overall positive effect of treatment on reducing recidivism of the offenders. The average effect for all treatment types (including criminal sanctions, which have been shown to have either zero or a negative effect) was about 9 or 10 percentage points (McGuire 2002:14). The meta-analyses also answered the question of what does not work as far as treatment programs. Deterrence-based interventions, "Scared straight" programs, and vocational training that was not linked to real prospects of employment were all found to have either no effect or a negative effect on reducing recidivism (McGuire 2002:20). One startling finding in two of their meta-analyses was that substance abuse treatment and drug abstinence programs were only slightly positive and not significantly different from having no effect at all (McGuire 2002:21). This does not mean, however, that no treatment programs reduce recidivism. Wormith et al. (2007:880) found in their review of correctional programs that general cognitive based programs and therapeutic communities both slightly reduced recidivism rates. It should be clear that there are still aspects of the treatment programs that need to be modified or improved to achieve a goal of reducing recidivism among drug offenders.

There is also research showing that certain characteristics of offenders themselves may influence whether they are likely to be successful in treatment. Through the Drug Abuse Treatment Outcome Study (DATOS), a national study of long-term residential programs, part of this issue was addressed (Hiller, Knight, Broome and Simpson 1998:467). The researchers found that African American, older, and better educated offenders were more likely to have success in the program (defined as remaining in the program for 90 days) whereas those with more prior arrests were more likely to not remain in the program for the entire 90 days (Hiller et al. 1998:475). Therefore, because demographic characteristics may influence an offender's odds of remaining in treatment, it is important to control for such characteristics in this study.

Placing individuals in treatment after being released from prison is also an effort to give drug offenders an opportunity for a turning point in their lives and a change toward desistance. However, it can also be argued that treatment programs may also put offenders at a higher risk of reoffending after their release. Just as placing individuals in prison can increase their odds of reoffending, it can also be said that placing individuals in treatment programs may have the same effect. While treatment programs can be a place for drug offenders to rehabilitate, they are also places where drug offenders interact closely with other offenders of the same type. As noted earlier, Southerland and Cressy's (1924) theory of differential association states that associating more often and having more close interactions with individuals who define crime as favorable leads to increased criminal behavior. Thus, placing offenders, especially lower-level offenders, in treatment may increase their odds of recidivism because of the favorable definitions of crime learned from other offenders in the same treatment program. Higher-level offenders, however, may not be affected as much by the interactions with other offenders because they may have already learned and absorbed the favorable definitions of crime. Also, as Southerland and Cressy (1924:76) point out in their seventh proposition, differential associations vary in frequency, duration, priority, and intensity. Therefore, those individuals who are exposed to favorable definitions of crime more often, for a longer period of time, earlier in their life, and through significant individuals in their lives will be more likely to engage in criminal behavior.

In addition, Lemert's (1951) labeling theory can also be applied to treatment programs. While those who are sent to prison are labeled as criminal, individuals placed in drug treatment after release from prison are labeled as criminals as well as drug addicts. Absorbing such labels can lead to increased involvement in drug offending as well as other types of reoffending upon leaving the treatment program. However, it is still not determined whether the positive effects

on recidivism we hope can come from treatment can outweigh the negative effects that can come from being associated with drug offenders or being labeled as one.

As was mentioned earlier, Linster (1999) conducted a study of drug offenders in Florida who were released from prison and admitted to supervision in the community from July 1, 1991, through June 30, 1997 which will serve as the basis for this study. The data set that was collected includes information on drug offenders admitted to three different treatment programs: secure residential programs, non-secure residential programs, and non-residential treatment. Residential programs are programs where the offender lives in the treatment center after being released from prison and these programs focus on substance abuse rehabilitation including vocational and educational services (Linster 1999). Secure residential programs are live-in programs and the offender's access inside and outside of the treatment center is limited because offenders in this type of treatment program tend to be the more severe cases of drug abusers (Linster 1999). This type of treatment may not be appropriate for every drug offender, however, which is why other programs are available. Non-secure residential programs are minimum-intensity residential programs that generally last only about six months (which includes two months of substance abuse treatment and four months of employment reentry preparation) (Linster et al. 1999). There is also one type of treatment that is community-based. Non-residential treatment allows the offender to live in the community yet still recieve treatment through activities such as drug education classes and outpatient drug treatment (Linster 1999). These three treatment programs, and a control group of those who did not receive treatment, served as the basis for an evaluation of the effectiveness of treatment at reducing recidivism.

In the research that Linster (1999) conducted, recidivism was measured in terms of a failure of parole (by re-offending, by committing a new offense, or by committing a technical

violation of parole). The analysis measured an overall 15% decrease in the expected number of parole failures based on the treatment programs (Linster 1999). This implies that there is some benefit in requiring released prisoners to be involved in some type of community treatment program. Linster (1999) also used logit models to measure the comparative effectiveness of the different types of programs. The results showed that the two residential programs are about equal in effectiveness (Linster 1999). Thus, this study will analyze residential treatment programs overall, as will be discussed in a later section of the proposal. In addition, Linster (1999) found that receiving no treatment would be more effective for reducing the commission of new offenses than at reducing recidivism for the same offense. However, even with these results, it is still not clear what type of treatment works best for certain offenders.

This current study expands upon the results of Linster's (1999) study, and focuses on the residential programs to determine whether the programs are effective across multiple criminal classification levels of drug offenders. Residential programs involve a higher intensity of treatment, which could explain why they have been found to be effective in the past, but the relative effectiveness for different felony levels of offenders has not been completely determined. This question is addressed further in this study.

III.   Objectives

As the review of literature demonstrates, there are multiple competing theoretical and empirical explanations for why individuals recidivate or desist over the life course and which offenders are more likely to recidivate. In order to promote effective programs, it is necessary for research to focus on what treatment works for various felony classification levels of drug offenders. The objective of this research is to determine how effective spending additional time in residential drug treatment is for offenders convicted of a primary offense of felony 1 (most serious) compared to felony 2 or 3 (less serious) drug offenses. The following hypotheses were tested in this study.

Hypothesis 1: Spending additional time in a residential treatment program will decrease drug offenders' odds of recidivism.

Hypothesis 2: Drug offenders convicted of a felony 1 primary offense will be less likely to recidivate than those convicted of a felony 2 or 3 offense.

Hypothesis 3: Length of time spent in a residential treatment program and criminal classification level will have an interaction effect on odds of recidivism for drug offenders, so that length of time spent in a residential treatment program will decrease the odds of recidivism more for offenders convicted of a felony 1 than for those convicted of a felony 2 or 3 offense.

IV.   Description of Methods

This study is a quantitative statistical analysis of the existing data set mentioned earlier, Linster and Lattimore (1999) "Evaluating Recidivism Among Drug Offenders in Florida's Residential and Non-Residential Substance Abuse Treatment Programs, 1991-1997." This data set was obtained through the National Institute of Justice and the Inter-University Consortium for Political and Social Research (ICPSR) and includes arrest and treatment data, as well as other useful variables, on drug offenders in Florida who were released from prison into the community including those released into various forms of community supervision. The data are derived from case history records of all drug-involved offenders in the state of Florida who were released into community supervision from July 1, 1991, through June 30, 1997. These records were made available to Linster and Lattimore by the Florida Department of Corrections. This study has also been approved by the Institutional Review Board (IRB) at Virginia Polytechnic Institute and State University, signifying that it has been found to be an appropriate study on human subjects.

The total sample size for the selected variables, and used in some of the univariate and bivariate statistics presented here was 3,744 (see tables for sample sizes). However, due to missing data on some variables, the final binary logistic regression analysis using listwise deletion resulted in a sample of 3,710 cases. This sample was comprised of only those drug-involved offenders in the data set who were admitted into residential drug treatment between 1991 and 1994. The sample included those whose current offense included a drug charge with a criminal classification level of felony 1, 2 or 3, and were admitted to either secure or non-secure residential treatment programs. While these programs differed in intensity, they were found by Linster (1999) to have about equal effects on expected numbers of failures in community supervision both for new offenses and for other violations. However, to determine if there was a

Table 1: Independent Samples t-test Results Comparing Mean Time in Treatment Between Offenders in Secure and Non-Secure Residential Treatment Programs				
	Mean	t	df	Sig. (2-tailed)
Secure	2.62	1.37	3710	.17
Non-secure	2.49			
N=3712				

Table 2: Crosstabulation of Recidivism of those in Secure Compared to Non-Secure Programs			
	Recidivated	Did not Recidivate	Total
Secure Programs	302 12.1%	85 9.6%	387 11.4%
Non-secure Programs	2198 87.9%	801 90.4%	2999 88.6%
Total	2500 100.0%	886 100.0%	3386 100.0%
Chi-square: 3.995　　　Sig: 0.046			
N= 3396			

difference of mean length of time spent in treatment, a t-test was conducted to compare average length of time spent in treatment for offenders placed in the two types of treatment. The results of the t-test (see Table 1) for mean time in treatment of individuals placed in secure compared to non-secure treatment show a t-value of 1.37, which is not significant. This indicates that there is not a significant difference in average length of time in treatment for those offenders placed in secure compared to non-secure residential treatment programs. Therefore, offenders placed in the two types of residential treatment were combined in the final analysis.

In addition, it is important to note that the data on secure treatment include all cases treated in a secure facility and admitted to community supervision between July 1, 1991, and June 30, 1993, while the data on non-secure treatment included all cases treated in a non-secure facility and admitted to community supervision between July 1, 1991, and June 30, 1995. Due to this difference in time span of the records, a dummy variable to distinguish between those in

secure programs and non-secure programs was included in the regression model to test if there was a significant effect of an offender being placed in secure compared to non-secure treatment on offenders' odds of recidivism.

The variables for this study that were selected from the data set to determine the odds of recidivating for different criminal classification levels of offenders will be described in this section. To classify these levels of offenders, this study used the primary offense felony level variable as the contextual/specification level variable. The sample was split into 2 groups based on this primary offense level (listed in descending order of seriousness of offense): felony 1, and felony 2 or 3. Those in the data set that were convicted for a misdemeanor were dropped from the analysis because of the small number of cases for such individuals. The two groups that were used in the analysis were compared to determine under what conditions (or for what felony levels of offender) the effect of time in treatment on recidivism held true.

The dependent variable that was used in this analysis was the outcome of the community supervision period. This variable was recoded into a dichotomous recidivism variable, with technical violation or felony/misdemeanor revocation coded as 1 (recidivism) and normal or early court term or pardon coded as 0 (non-recidivism). As in the Linster study (1999:7), those cases with an outcome recorded as death, moved out of state, non-reporting, or not available for supervision were excluded from the analysis because these were very few cases in the sample. Those cases with an outcome recorded as absconding or pending violation will also be excluded because these do not signify either recidivism or non-recidivism (Linster 1999:7).

The independent variable for this study was the number of years the individual was committed to for the current supervision sentence. This variable may also be referred to as

Table 3: Correlations with Un-centered Variables				
	Felony 1	Felony 2 or 3	Un-centered time in treatment	Interaction of Felony 1 and un-centered time in treatment
Felony 1	1			
Felony 2 or 3	-1**	1		
Un-centered time in treatment	.12**	-.09**	1	
Interaction of Felony 1 and un-centered time in treatment	.79**	-.69**	.26	1
** correlation is significant at the 0.01 level (2-tailed)				
N= 3733				

Table 4: Correlations with Centered Time in Treatment and Interaction Term Variables				
	Felony 1	Felony 2 or 3	Centered time in treatment	Interaction of Felony 1 and centered time in treatment
Felony 1	1			
Felony 2 or 3	-1**	1		
Centered time in treatment	.12**	-.09**	1	
Interaction of Felony 1 and centered time in treatment	.40**	-.35**	.30	1
** correlation is significant at the 0.01 level (2-tailed)				
N= 3733				

length of time in treatment. This variable was also used, with the Felony 1 level variable, to create the interaction term to be used in the final logistic regression model. In examining the correlations (see Tables 3 and 4) it was noted that the interaction term was highly intercorrelated with the felony level variable. Using multiple regression (see Table 5) to determine the variance inflation factors (VIFs) for the variables, we can see that the original variables of Felony 1 and the interaction of felony 1 and time in treatment both have high VIFs. This is an indicator of multicollinearity among the variables. In an effort to correct for this, the variable for length of time in treatment was centered using deletion scores. In other words, a new variable was computed by subtracting the mean value of the length of time in treatment variable from that

Table 5: Multiple Regression of Recidivism Regressed Upon Felony 1, Un-centered Time in Treatment, and Interaction of Felony 1 and Un-centered Time in Treatment			
	B	Standard Error	VIF
Felony 1	-.09	.08	2.83
Un-centered time in treatment	.05***	.01	1.08
Interaction of felony 1 and un-centered time in treatment	-.00	.02	2.956
*** p < .001			
N= 3377			

Table 6: Multiple Regression of Recidivism Regressed Upon Felony 1, Centered Time in Treatment, and Interaction of Felony 1 and Centered Time in Treatment			
	B	Standard Error	VIF
Felony 1	-.09	.05	1.11
Centered time in treatment	.05***	.01	1.08
Interaction of felony 1 and Centered time in treatment	-.00	.02	1.18
*** p < .001			
N= 3377			

original variable. This centered variable was multiplied by the Felony 1 variable to create a new interaction term. This term represented the interaction effect of length of time in treatment (centered) and criminal classification level. Another multiple regression (see Table 6) was run, using the centered variables. The VIF for Felony 1 dropped from 2.83 to 1.11, and the VIF for the interaction term dropped from 2.956 to 1.18. This indicates that by using the centered variables, multicollinearity in the final binary logistic regression model was minimized which allows for more accurate interpretation of the results.

Finally, five controls were added to the logistic regression model, based on the possibility that these variables may influence recidivism rates. These controls were race (black, latin, and other race compared to white), gender (female compared to male), age at current admission, number of prior supervision terms, and number of prior prison commitments.

The aforementioned variables were analyzed using multivariate statistical analysis through the use of binary logistic regression. The study involved one binary logistic regression model, which included the dependent variable (recidivism), the independent variable (length of time in treatment), the control variables (race, gender, age, number of prior supervision terms and number of prior prison sentences), a dummy variable for secure/non-secure facilities, the Felony 1 variable, and the interaction term (length of time in treatment multiplied by criminal classification level). The results provided logistic coefficients, which can be compared to determine which criminal classifications of drug offenders have the highest and lowest likelihood of recidivating following residential drug treatment.

V.   Results

The first results for this study are the descriptive statistics for each of the variables in the model (excluding the interaction term). These decriptives can be found in Tables 7 and 8 (see p. 25). Next, a crosstabulation of recidivism and felony level was analyzed to see if there is a simple relationship between felony level and recidivism. As you can see in Table 9, 68.8% of felony 1 offenders recidivated, while 74.0% of felony 2 or 3 offenders recidivated. Using a chi-square test for significance, with a chi-square value of 1.245 and a significance of .26, we can see that there is not a significant difference in recidivism rate for felony 1 compared to felony 2 or 3 offenders, simply using bivariate statistics with no controls.

Two additional t-tests were also conducted for further information on the variables that were included in the logistic regression model. First, a t-test was conducted comparing mean length of time spent in treatment for those convicted of felony 1 compared to felony 2 or 3 offenses (see Table 10). The t-value was 4.74, which was significant. This means that there was a significant difference in mean length of time that those convicted of felony 1 compared to felony 2 or 3 spent in residential treatment programs. Second, a t-test was conducted comparing mean length of time spent in treatment for those who recidivated and those who did not (see Table 11). With a t-value of 2.162, which was also significant, we can see that there is a significant difference in mean length of time spent in residential treatment for those who recidivated and those who did not. In addition, Pearson Correlations were calculated for the appropriate variables, which can be found in Table 12.

The model used in the logistic regression for this study was recidivism regressed upon time in treatment, race, gender, age, type of residential treatment (secure compared to non-

Table 7: Descriptives for Dummy Variables		
Variables	**Percentage**	**N**
Recidivism (N= 3366)		
Yes	73.80%	2484
No	26.20%	882
Offense classification level (N= 3710)		
Felony 1	2.99%	111
Felony 2 or 3	97.00%	3599
Race (N= 3723)		
White*	43.30%	1612
Black	55.92%	2082
Latin	0.54%	20
Chinese	0.00%	0
American Indian	0.00%	0
Japanese	0.00%	0
Other Race	0.24%	9
Gender (N= 3723)		
Male*	72.90%	2714
Female	27.10%	1009
Secure/Non-Secure (N= 3723)		
Secure	11.20%	417
Non-Secure*	88.0%	3306

Table 8: Descriptives for Continuous Variables						
Variable	**N**	**Mean**	**Standard Deviation**	**Range**	**Min**	**Max**
Time in Treatment (years)	3733	2.50	1.84	29.95	.055	30.00
Age (at current admission)	3744	31.28	7.33	51.66	15.910	67.57
Number of prior prison commitments	3744	.71	1.18	8.00	0	8.00
Number of prior supervision terms	3744	1.61	1.44	8.00	0	8.00

secure), number of prior prison terms, number of prior supervision terms, felony level and the

interaction of length of time in treatment and criminal classification level. By using the

Nagelkerke R Square (which was .093 for this model) we can see that this model explains about

Table 9: Crosstabulation of Felony Level and Recidivism			
	Felony 1	Felony 2 or 3	Total
Recidivated	64 68.8%	2436 74.0%	2500 73.8%
Did not recidivate	29 31.2%	857 26.0%	886 26.2%
Total	93 100.0%	3293 100.0%	3386 100.0%
Chi-square: 1.245, Sig.: .26			
N= 3733			

Table 10: Independent Samples t-test Results Comparing Mean Time in Treatment Between Felony 1 Offenders and Felony 2 or 3 Offenders				
	Mean	t	df	Sig. (2-tailed)
Felony 1	3.79	4.74	111.50	.00
Felony 2 or 3	2.47			
N=3712				

Table 11: Independent Samples t-test Results Comparing Mean Time in Treatment Between Those Who Recidivated and Those Who did not Recidivate				
	Mean	t	df	Sig. (2-tailed)
Recidivated	8.18	2.162	3384	.00
Did not Recidivate	7.94			
N=3386				

9% of the variance in recidivism rates for drug offenders admitted to residential drug treatment after release from prison. The predictive power of this model is 73.7%.

There were four controls in this model that were significant; and these are worth noting. First, race was significant for blacks when compared to the reference group (whites). With an odds ratio of .83, (p=.03), those individuals identified as black were 83% as likely as those identified as white to recidivate, holding constant all other variables in the model (age, gender, secure/non-secure treatment, number of prior prison terms, number of prior supervision terms, time in treatment, and felony level). Second, age was also a significant indicator of odds of

Table 12: Pearson Correlations[a]								
	Recidivism	Time in Treatment	Interaction of Criminal Classification Level and Time in Treatment	Age	Felony 1	Felony 2 or 3	Number of Prior Prison Commitments	Number of Prior Supervision Terms
Recidivism	1							
Time in Treatment	.161**	1						
Interaction of Criminal Classification Level and Time in Treatment	0.007	. 226**	1					
Age	-.085**	0.01	-0.009	1				
Felony 1	-0.02	.095**	.799**	-0.018	1			
Felony 2 or 3	0.013	-.058**	-.688**	-0.011	-1**	1		
Number of Prior Prison Commitments	.124**	.177**	.039*	.168**	0.016	-0.009	1	
Number of Prior Supervision Terms	.142**	.183**	0.019	.198**	-0.009	0.012	.615**	1
**Correlation is significant at the 0.01 level (2-tailed).								
*Correlation is significant at the 0.05 level (2-tailed).								
[a]Listwise deletion was used; N=3377								

recidivism. When controlling for the other variables in the model, age had an odds ratio of .96

(p=.00). Thus, those who are older have lower odds of recidivism (96%) than those who are

younger, which was theoretically expected based on the research cited in the review of literature.

Also, the number of prior prison terms and the number of prior supervision terms were both

significant predictors of recidivism with positive effects on odds of recidivism. Therefore, those

who have been sentenced to more prior prison terms were 113% as likely to recidivate as those

who have been sentenced to fewer prison terms (p=.02), when controlling for the other variables

in the model. Similarly, those who have had more prior supervision were 120% as likely to

recidivate as those who have fewer prior supervision terms (p=.00) when controlling for the

other variables in the model. These findings speak toward the effect that amount of involvement

Table 13: Logistic Regression of Recidivism Among Drug Offenders in Post-Prison Residential Drug Treatment			
Variables	**Logistic Coefficient**	**Standard Error**	**Odds Ratio**
Time in Treatment	.53***	.07	1.70
Felony 1 Offenders	.53*	.24	1.697
Interaction (time in treatment and criminal classification level)	-.14	.24	.87
Race[a]			
Black (yes = 1)	-.19*	.08	.829
Latin (yes = 1)	.02	.55	1.02
Other Race (yes = 1)	-.95	1.08	.39
Female[b] (yes = 1)	.06	.09	1.06
Age	-.04***	.01	.96
Number of prior prison commitments	.12*	.05	1.13
Number of prior supervision terms	.18***	.04	1.20
Secure treatment program[c] (yes = 1)	-.102	.14	.90
Constant	2.50*	1.25	12.04

N=3710

$*p < 0.05$; $**p < 0.01$; $*** p < 0.001$

[a] White persons are the reference group

[b] Males are the reference group

[c] Non-secure treatment programs are the reference group

that the individual has in criminal behavior may have on recidivism. Gender was also controlled for, but was not found to be significant (p=.51). Thus, females do not differ significantly from males in odds of recidivism when controlling for length of time in treatment, criminal classification level, age, race, and number of prior supervision and prison terms.

It is also important to note that a control for secure compared to non-secure residential programs was included in the model, and this variable was also not significant (p=.46). This means that there is no significant difference in odds of recidivism for those in secure residential treatment compared to those in non-secure residential treatment, controlling for length of time in treatment, criminal classification level, age, race, gender, and number of prior supervision and prison terms.

Next, the results for the effect of amount of time in treatment on odds of recidivism are particularly notable. While Linster (1999) found that time spent in residential treatment programs decreases an individual's odds of recidivism, this research expanded on this finding to include controls for age, race, gender, number of prior prison commitments and number of prior supervision terms. The results of the logistic regression analysis showed that time spent in residential treatment actually increases odds of recidivism, when controlling for age, race, gender, number of prior prison commitments and number of prior supervision terms. With an odds ratio of 1.70 (p=.00), this means that those who spent more time in residential treatment were 170% as likely to recidivate as those who spent less time in such treatment.

The results also show that Felony 1 variable had an odds ratio of 1.70 (p=.03). This means that those individuals convicted of a felony 1 level offense were 170% as likely to recidivate as those convicted of felony 2 or 3 level offenses when controlling for age, race, gender, and number of prior supervision and prison terms. Finally, the results of the logistic regression show that the interaction term for length of time in treatment and criminal classification level was not significant (p=.55). Thus, there is no significant interaction between criminal classification level and time in treatment (this is not adding any significant effect to the equation). This implies that while time in treatment and felony level separately have their own

effects on an individual's odds of recidivism, being both convicted of a higher-level offense (felony 1) and spending more time in treatment does not have an additional effect on such an individual's odds of recidivism.

VI.   Discussion

The results of this study show that when criminal classification level, race, age, gender and number of prior supervision and prison terms are controlled for, spending additional time in treatment actually increases a drug offender's odds of recidivism. This finding is particularly important because it demonstrates that certain residential drug treatment programs are not having the desired effect on recidivism and instead are having the opposite effect. While there is still some variance in recidivism that is left to be explained, this result indicates that there is some aspect of residential drug treatment following prison that is reversing the desired effect.

 As was noted earlier, there are a few theories that could explain why this is occurring. First, the increase in odds of recidivism could be a result of increased association with deviant peers while incarcerated and in treatment. Because criminal behavior is learned and stems from an excess of favorable definitions of criminal behavior (Southerland and Cressy 1924), the more time an individual spends in a residential treatment facility surrounded by other individuals who may define criminal behavior as favorable may lead to increased recidivism upon release. Second, the criminal and social stigma associated with involvement in the criminal justice system and drug treatment can influence individuals to accept the labels of criminal and addict. According to labeling theory (Lemert 1951), acceptance of such labels may cause an increase in criminal behavior. In addition, the treatment programs used in this study were involuntary, which could also contribute to the reasons why they are ineffective at reducing recidivism.

The findings of this study also show that drug offenders convicted of a felony 1 charge have higher odds of recidivism than drug offenders convicted of a felony 2 or 3 offense, when controlling for age, race, gender, and number of prior prison and supervision terms. This could

be due to a number of factors. First, those convicted of more serious offenses may be more deeply involved with the criminal and drug subcultures, making it more difficult for them to avoid criminal behavior after their release from treatment. According to Hirschi's (1969) control theory of delinquency, the more attachment, commitment, involvement and belief that an individual has to the criminal or drug subcultures, the higher their tendency is to commit crime. Therefore, offenders with more serious drug charges may have stronger bonds to the criminal or drug subcultures through attachment, commitment, involvement and belief, which could explain why they are more likely to recidivate than offenders with less serious charges. Second, Southerland and Cressy's (1924) differential association theory can also contribute to an explain of this. Offenders convicted of a more serious offense may have differential associations that favor criminal behavior which are more intense, experienced at a greater frequency, have occurred for a longer period in those offenders' lives, and may come from individuals who have greater priority to the offender.

Third, being convicted of a more serious charge, like a felony 1 level charge, may make it more difficult for those individuals to gain legitimate employment upon release from prison and treatment. Those convicted of a felony 1 level offense have probably been out of the workforce for longer, because they spent more time in prison. This, coupled with the stigma associated with felony 1 offenses, may lead to greater difficulty finding legitimate employment for such offenders. While felony 2 and 3 level offenders will still have difficulty finding employment, it is possible that it would be more difficult for offenders with a felony 1 charge. However, employment information was not included in the data used in this study so this is something that could be looked at in the future. Further research on specific offense type and recidivism will provide more information for understanding these results.

It is important to note that the results of this research are specific to the population that was studied and was described earlier. The results can be generalized only for similar populations, and cannot be generalized for all prison or treatment populations so as to claim that spending time in any post-prison drug treatment program will increase an individual's odds of recidivism. The results are limited to explaining recidivism among those drug offenders included in the data set and similar populations, and the study design was limited according to what was available in the data set. However, because this analysis shows such controversial results, it is important for more research to be conducted to determine if this is the case for other treatment programs. In addition, more data should be gathered on offenders of all criminal classification levels to determine if those convicted of misdemeanors have the same or different odds of recidivism when compared to felony 1, 2 and 3. More data could also be included in future studies to account for factors such as gaining employment, getting married, becoming a parent, becoming more religious, and other similar factors to give a more complete understanding of why individuals recidivate or desist.

I would also like to mention some limitations and weaknesses of this study. First, as was mentioned in an earlier section, I recognize the problem of combining secure and non-secure residential treatment programs. Several precautionary measures, as described in the methods section, were taken to resolve this problem, but future studies on this topic may benefit from looking at each type of residential program separately. Another weakness can be found in the variables for race, as Latin and Other Race both have very small sample sizes. If I were to repeat this study, it could be improved by dropping those in those two racial categories from the analysis, and only including those who were identified as either white or black. Finally, the variable for time in treatment could be problematic because we cannot know for sure who

determines the length of time the offender stays in treatment. In some states, judges take

recommendations from the specialists at the treatment program facility to decide when an

individual can be released. It is not clear from the data set or previous research by Linster (1999)

whether this was the case for the offenders in this study. Further investigation into this issue

may provide clearer interpretation of these results.

Finally, while it is tempting to make policy suggestions based on these findings, there is

still much research to be done on the topic before it can be said that drug treatment programs are

not effective. However, these results show that it is necessary to re-evaluate such programs to

meet the needs of the offenders and the community by actually reducing recidivism. From the

results of this study, it is clear that despite the efforts of treatment programs to reduce recidivism,

individuals who spend more time in treatment and who were convicted of more serious offenses

are more likely to recidivate in the future. This implies that there is something else that we have

not yet addressed, either about the individual offenders or about the entire system, which is

causing this to occur.

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Appendix: additional tables

Table 14: Crosstabulation of Recidivism of Those Identified as White Compared to not White			
	White	Not White	Total
Recidivated	1014	1486	2500
	70.2%	76.5%	73.8%
Did not Recidivate	430	456	886
	29.8%	23.5%	26.2%
Total	1444	1942	3386
	100.0%	100.0%	100.0%
Chi-square: 17.00 Sig: .00			
N= 3386			

Table 15: Crosstabulation of Recidivism of Those Identified as Black Compared to not Black			
	Black	Not Black	Total
Recidivated	1466	1034	2500
	76.6%	70.3%	73.8%
Did not Recidivate	449	437	886
	23.4%	29.7%	26.2%
Total	1915	1471	3386
	100.0%	100.0%	100.0%
Chi-square: 16.88 Sig: .00			
N= 3386			

Table 16: Crosstabulation of Recidivism of Those Identified as Latin Compared to not Latin			
	Latin	Not Latin	Total
Recidivated	13	2487	2500
	64.8%	73.9%	73.8%
Did not Recidivate	6	880	886
	31.6%	26.1%	26.2%
Total	19	3367	3386
	100.0%	100.0%	100.0%
Chi-square: .29 Sig: .59			
N= 3386			

Table 17: Crosstabulation of Recidivism of Those Identified as Other Race Compared to not Other Race			
	Other Race	Not Other Race	Total
Recidivated	7	2493	2500
	87.5%	73.8%	73.8%
Did not Recidivate	1	885	886
	12.5%	26.2%	26.2%
Total	8	3378	3386
	100.0%	100.0%	100.0%
Chi-square: .78 Sig: .38			
N= 3386			

Table 18: Crosstabulation of Recidivism of Those Identified as Female Compared to Male			
	Female	Male	Total
Recidivated	658	1842	2500
	72.0%	74.5%	73.8%
Did not Recidivate	256	630	886
	28.0%	25.5%	26.2%
Total	914	2472	3386
	100.0%	100.0%	100.0%
Chi-square: 2.20 Sig: .14			
N= 3386			