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Evaluating the Effectiveness of Substance Abuse Treatment Within the Illinois Prison System and Its Effect on Recidivism

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EVALUATING THE EFFECTIVENESS OF SUBSTANCE ABUSE TREATMENT WITHIN THE ILLINOIS PRISON SYSTEM AND ITS EFFECT ON RECIDIVISM

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ABSTRACT

The present study aims to evaluate the efficacy of two specific substance use disorder (SUD) treatment programs within the Illinois State prison system between July 1, 2010, and June 30, 2015. This study utilizes a quasi-experimental research design to evaluate the corrections-based Therapeutic Community (TC) programs at the Sheridan and Southwestern Illinois Correctional Centers. These programs are evaluated based on the effects they have on reoffending, specifically highlighting their effect on young individuals. The final sample used in the present study was taken from a population of 72,906 men released from the Illinois state prison system between July 1, 2010, and June 30, 2015. Participation in corrections-based SUD treatment, in the form of the TC modality, resulted in an approximate 15% reduction in the likelihood of violent recidivism, three years post-program participation. In addition, participation in corrections-based SUD treatment appeared to increase general recidivism rates, three years post-program participation.

INTRODUCTION

In 2016, almost half (49%) of state prisoners met the DSM-IV diagnostic criteria for drug dependence or abuse, highlighting the need for effective substance abuse treatment within the U.S. state prison systems (Carson, 2018). In addition to meeting diagnostic criteria, 90% of state prisoners reported some drug use in their lifetime, 60% reported using drugs in the 30 days prior to arrest, and 40% reported drug use at the time of their offense. Self-reported data collected for the 2016 Survey of Prison Inmates indicated that only 20% of state prisoners received some type of substance abuse treatment while incarcerated. Of the state inmates who received treatment, 12% received treatment in a residential facility or residential treatment unit (Maruschak, Bronson, & Alper, 2016).

Evaluating corrections-based substance abuse treatment programs and their effect on recidivism is imperative to determine which treatment modality is the most effective for incarcerated individuals with substance use disorders (SUDs). Scholars have argued that reducing drug dependence or abuse within our prison populations will have a direct effect on recidivism (Zgoba et al., 2020), improving their overall quality of life and their community's health. For many individuals, their period(s) of incarceration serve as opportunities for the state to provide services and interventions that may not be easily accessible in offender's home communities.

The Illinois correctional system utilizes the Therapeutic Community (TC) treatment modality as one method of SUD intervention. Historically, this treatment modality has been used with success in both community and incarceration settings. One of the first programs to utilize

this modality, founded in 1958 in Santa Monica, CA, was a community-based treatment program named Synanon. The original goal of this program was to respond to the unique needs of individuals suffering from SUD by utilizing peer support networks to encourage change. This model of community-based SUD treatment was unlike most treatment programs on the market at the time, and it inspired many residential treatment facilities throughout the U.S. which would evolve into the TC modality used today (Hiller, 2023). The current TC model we see most often utilized today is a highly structured residential program that has been shown to have marked success in treating individuals with SUDs as well as co-occurring mental health issues. With an emphasis on community accountability and a whole-body approach to treatment, this modality has been successfully modified to be run in multiple correctional settings across the country, especially when paired with comprehensive aftercare programming (Mitchell, Wilson & MacKenzie, 2007; Belenko, Hiller & Hamilton, 2013). A 2013 evaluation of TC use within the Pennsylvania Department of Corrections found that TC participants had moderate but significant reductions in reincarceration over a 4-year follow-up period (Welsh & Zajac, 2013). An evaluation of TCs within the Delaware correctional system had similarly positive findings. In this study, TC participation was found to reduce the likelihood of being re-arrested within 5 years by 70%. Transitional aftercare participants were four times more likely to remain drug-free during the 5-year follow-up period when compared to participants who did not receive treatment or aftercare (Inciardi, Martin & Butzin, 2004).

In Illinois, two state prisons operate as fully dedicated substance abuse TCs: the Southwestern Illinois Correctional Center and the Sheridan Correctional Center. These two facilities both operate modified TC treatment models, including intensive, structured residential treatment and aftercare programming. The current study aims to evaluate these two programs and

their effect on recidivism within the state of Illinois, looking at both arrests for any offense and arrests specifically for violent crimes as the main recidivism outcomes. Special attention will be given to emerging adults, to examine the effect age has on the efficacy of TC SUD treatment programming.

LITERATURE REVIEW

Definitions

Substance Use Disorders

The *Diagnostic and Statistical Manual of Mental Disorders,* Fifth Edition (DSM-V) describes SUDs as "a cluster of cognitive, behavioral and physiological symptoms indicating that the individual continues using the substance despite significant substance-related problems". Under this umbrella exist multiple sub-diagnoses focusing on specific substances (for example, Cocaine Use Disorder, Opioid Dependence Unspecified, etc.). The DSM-V diagnostic criteria for SUDs requires the endorsement of at least two of 11 criteria over the prior 12 months. Table 1 (American Psychiatric Association, 2013, pg. 483-484) details these 11 criteria, which are organized into four categories: impaired control, social impairment, risk use, and pharmacological criteria (Table 1). SUDs can vary in severity; the DSM-V describes a mild SUD as the presence of two to three criteria, a moderate SUD as the presence of four to five criteria, and a severe SUD as the presence of six or more criteria (American Psychiatric Association, 2013, pg. 483-484).

Table 1. DSM-V Substance Use Disorder Diagnostic Criteria by Category[1]

Impaired Control	Social Impairment	Risk Use	Pharmacological Criteria
1. Taking the substance in larger amounts or over a longer period than was originally intended	5. Failure to fulfill major role obligations at work, school, or home	8. Recurrent substance use in situations in which it is physically hazardous	10. Tolerance defined as: requiring a markedly increased dose of the substance to achieve the desired effect or a markedly reduced effect when the usual dose is consumed.
2. A constant desire to cut down or regulate substance use with multiple unsuccessful efforts to decrease or discontinue use	6. Continuing substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance.	9. Continued substance use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.	11. Development of withdrawal symptoms, which can be relieved by taking more of the substance.
3. Spending a great significant amount of time obtaining the substance, using the substance, or recovering from its effects.	7. Important social, occupational, or recreational activities may be given up or reduced because of substance use, withdrawing from family activities and hobbies in order to use substance.		
4. Cravings defined as: an intense desire or urge for the drug that may occur at any time but is more likely when in an environment where the drug previously was obtained or used.			

[1] American Psychiatric Association. (2013). Substance use disorders. In *Diagnostic and statistical manual of mental disorders* (5th ed.).

Recidivism

Recidivism is a measure commonly used to compare and track the efficacy of criminal justice initiatives and interventions. There is no single, aggreged way to operationalize recidivism however, definitions often include two components, the measure of recidivism and a clearly defined follow-up period. Across both corrections literature and real-world risk assessment tools the details of definitions vary greatly. Many define recidivism in a general way,

measuring recidivism as any new arrest, whether violent or non-violent. The Ohio Risk Assessment System (ORAS), a commonly used risk assessment in correctional settings, defines recidivism as any "arrest for a new crime" within a 12-month follow-up period (Latessa, Lemke, Makarios, Smith & Lowenkamp, 2010). A 2018 Bureau of Justice Statistics (BJS) report on state prisoner recidivism defines recidivism as any arrest within a nine-year follow-up period. In addition, this report examines first-time recidivism, defined as an annual percentage of the first arrest following a period of incarceration for an individual's initial prison stay (Alper, Durose & Markman, 2018). When examining recidivism among federal offenders, the United States Sentencing Commission defines recidivism as all rearrests, reconvictions, and reincarcerations for felonies, misdemeanors, and technical violations (i.e., violation of the conditions of supervised releases). The only offenses excluded from this measure were minor traffic offenses. In addition to this broad measure of recidivism, the U.S. Sentencing Commission recognizes an extended follow-up time of eight years (U.S. Sentencing Commission, 2016).

Other definitions of recidivism are more nuanced and specific. For example, the Violence Risk Appraisal Guide (VRAG) defines reoffending as "any new criminal charge for a violent offense" and aims to predict only violent reoffending among its subjects (Glover, Churcher, Gray, Mills & Nicholson, 2017; Quinsey, 2019). A 2018 study examining the effect prison visitation had on recidivism, defined recidivism as an individual being reconvicted for a felony crime within a three-year follow-up period (Cochran, Barnes, Mears & Bales, 2018). Another study examining the link between recidivism and mental and physical health measured recidivism in two ways, as both being re-incarcerated for a new charge and re-incarceration for a technical violation. This study also used three follow-up periods: 3 months, 9 months, and 15 months (Wallace & Wang, 2020).

A survey of past research on the topic suggests that measures of recidivism and follow-up periods vary greatly. A study published in 2015 comparing recidivism outcomes for corrections-based treatment participants in rural and urban areas defined recidivism "as being re-incarcerated in any state jail or prison for a technical parole violation and/or a new charge in the one-year post-release study follow-up period" (Staton-Tindall, Harp, Winston, Webster & Pangburn, 2015). A 2019 study examining the effect mental health, substance use, or co-occurring disorders have on recidivism also defined recidivism as re-incarceration or being returned to prison following release on parole. This study had a longer follow-up period, as it examined the first three years post reentry. This study further specified their measure by looking at both re-incarceration for a new offense and re-incarceration for a technical violation (Houser, Saum & Hiller, 2019). Another study examining how correctional programming's program fidelity impacted the intervention effectiveness also looked at new offenses and technical violations separately. The author's recidivism measure was defined as an individual returning to a correctional facility for any reason within a two-year follow-up period (Lowenkamp, Latessa, & Smith, 2006). One of the more nuanced studies focusing on recidivism for felony offenders mandated to residential substance use treatment measured recidivism as rearrest for a felony within a two-year follow-up period (Hiller, Knight & Simpson, 2006).

As in the current study, many studies utilize more general measures of recidivism. A 2017 study into the predictors of substance use and recidivism outcomes for drug treatment court clients defined recidivism as any arrest reported in the past 90 days (Wilson, Bandyopadhyay, Yang, Cerulli, & Morse, 2017). A 2004 study looking at five-year outcomes of specifically TC treatment participation measured recidivism as any arrest within both a 42-month and 60-month follow-up period (Inciardi, Martin & Butzin, 2004).

Clearly explaining the measures and follow-up periods used to define recidivism is essential when carrying out recidivism research. There is no perfect way to measure recidivism. As there are many different definitions used when operationalizing recidivism, authors must be precise and intentional in measuring this concept. As illustrated above, many definitions of recidivism are quite general, often using “all new arrests” as the measure of re-offending. The crucial decision surrounds the merits of using more or less specific measures of re-offending when defining recidivism. Some scholars argue that solely using re-arrest data provides an inaccurate measure of an individual's reoffending. In the U.S. Judicial System, there is an assumption of innocence until proven guilty, and many individuals who are arrested are never convicted, thus never found guilty. In some cases, researchers are unable to ensure an individual has re-offended if they were not found guilty, and these data sets may be inflated by those who did not commit the crime they were arrested for (Ruggero, Dougherty & Klofas, 2015; Klingele, 2019).

Conversely, using new arrests as a measure of recidivism may be advantageous as it allows researchers to use shorter follow-up times (Ringland, 2013; Latessa, Lemke, Makarios, Smith & Lowenkamp, 2010). From the time of arrest, it will likely take an individual months for their case to reach a final conviction (Ostrom, Hamblin, Schauffler & Raaen, 2020). This can cause researchers delays in obtaining the most up-to-date measurements of recidivism (Ringland, 2013). Despite the slower processing speed, measuring recidivism using re-conviction data may give researchers a more accurate view of serious re-offending. However, the disadvantage of using re-convictions as a measure is that not everyone who is arrested for or commits a crime will be successfully convicted, possibly producing a sample of formally incarcerated individuals that is far smaller than all those who reentered society (Ruggero, Dougherty & Klofas, 2015;

Klingele, 2019). Authors have argued that new arrest data can provide an accurate measure of recidivism because many individuals who are arrested are not convicted due to a reason other than innocence, such as limitations in judicial resources, lack of sufficient evidence, or prosecutorial misconduct (U.S. Sentencing Commission, 2016; Houser, Saum & Hiller, 2019).

The Illinois Department of Corrections (IDOC) defines adult recidivism as an inmate released to parole, mandatory supervised release (MSR), or discharged who are returned to IDOC for a prison sentence for a new felony conviction or a technical violence within three years of their release (Sentencing Policy Advisory Council, 2018). For men who exited IDOC prisons in 2013, the three-year recidivism rate was 46% (Sentencing Policy Advisory Council, 2018).

While there are many methods for defining and measuring recidivism, ultimately the "correct" measure of recidivism is the one that best matches the goals of the study, assessment tool, program being evaluated, or jurisdiction. In the current study, guided by current research and the data available, recidivism in this study is defined as any arrest for a new crime within three years of an individual's discharge from IDOC. In addition to new arrests for any crime, guided by current research, I also assess any new arrests for violent crimes (Mitchell, Wilson & MacKenzie, 2012; Houser, Saum & Hiller, 2019). Re-arrest for technical violations was not included because previous recidivism studies have suggested that data on arrests for new crimes paints a better picture of criminogenic needs as opposed to technical violation data (Latessa, Lemke, Makarios, Smith & Lowenkamp, 2010). In the current study, both general and specific (violent) recidivism is examined. Offenders who engage in both types of recidivism have unique risk factors and may respond differently to treatment. The current study utilizes a three-year follow-up period, which is consistent with similar studies examining recidivism and SUDs

(Ostermann, Salerno, & Hyatt, 2015; Houser, Saum & Hiller, 2019) It is also in alignment with the timeframe IDOC uses to define of recidivism (Illinois Department of Corrections, 2024).

Treatment of Incarcerated Populations

Need for Substance Abuse Treatment within an Incarcerated Population

Drug use, dependence, and abuse are prevalent and persistent issues within the United States incarcerated population. The U.S. Criminal Justice System has been grappling with this issue as far back as 1935 when the first correctional institution dedicated to incarcerating and treating "drug addicts" opened in Lexington, Kentucky (Campbell, Olsen, & Walden, 2021). In 2019, over 80% of U.S. state and federal correctional institutions offered some type of drug dependency, counseling, or awareness programs (Maruschak & Buehler, 2021). By the end of the 2016 fiscal year, 49% of state prisoners and 23% of federal prisoners met the DSM-IV[1] criteria for substance use disorder within 12 months prior to their admission to prison. Among those who did not meet the diagnostic criteria for a SUD, 65% of state prisoners and 53% of federal prisoners reported using drugs in the month before their admission to prison (Maruschak, Bronson, & Alper, 2021). More generally, 90% of state and 81% of federal prisoners reported using drugs at least once in their lifetime (Maruschak, Bronson, & Alper, 2021). In contrast, in 2016, the National Survey on Drug Use and Health (NSDUH) reported that 2% of the general population reported substance abuse or dependency within the past 12 months (Substance Abuse and Mental Health Services Administration, 2018).

[2] The most recent edition of the DSM is the 5th edition, the main difference between DSM-IV and the DSM-V is that in the new addition the criteria for "drug dependence" and "drug abuse" were combined into one category of "substance use disorder".

In 2015, the Federal Bureau of Prisons reported that offenders incarcerated for drug offenses made up 47% of federal prison populations (Motivans, 2019), and in the same year, 15% of state prisoners had committed a drug offense as their highest-level offense (Carson, 2018). Previous research suggests that incarcerated individuals are more likely to access drug treatment programs than the public. For example, between 2007 and 2009 around 8% of the general population who meet DSM-IV diagnostic criteria for SUDs participated in a drug treatment program, while, during the same period, 35% of individuals under active supervision (either probation or parole) and 30% of individuals who were arrested accessed these services (Bronson, Stroop, Zimme, & Berzofsky, 2020).

Historically, substance use treatment has not been prioritized within the U.S. criminal justice system. In the U.S., the 1970s and 1980s saw a steady increase in harsh "tough on crime" policies and with it a major shift away from rehabilitative criminal justice models (Miller, 1989; Lynch & Sabol, 1997; Morore & Elkavich, 2008). Many practitioners and researchers adopted an apathetic view of rehabilitation, instead backing the use of retributive and punitive policies within correctional settings (Cullen, Smith, Lowenkamp & Latessa, 2009).

Despite the clear need for substance abuse treatment within this population, illustrated by the aforementioned data, even today most inmates who would benefit from this treatment do not receive it. Among those inmates who do, there is often a lack of important aftercare or follow-up services. These wrap-around services are imperative to ensure long-term treatment efficacy and help reduce post-release drug-related mortality rates (NIDA, 2020, June 1).

Effects of Treatment within the Prison Population

An individual's period of incarceration offers unique opportunities to make substance abuse treatment more efficacious for offenders as well as combat the perpetual cycle of drug

abuse and offending. Corrections facilities have the ability to encourage offenders, who may not otherwise be amenable, to participate in treatment programs. During incarceration, offenders may have more readily available access to substance abuse treatment, as well as other programs, than they would otherwise. Theoretically, the ability to obtain drugs is limited in prison, which also aids offenders in their sobriety while completing substance abuse treatment (Mitchell, Wilson & Mackenzie, 2012).

For offenders with active SUDs, receiving treatment while incarcerated is a key part of their rehabilitation. Drug use is a dynamic criminogenic risk factor; it can lead to an individual associating with other offenders and put them at an increased risk for reoffending once released from prison (Andrews & Bonta, 2015). Participation in corrections-based substance abuse treatment programs has been shown to increase participants' positive self-perceptions and optimism upon release. The social and cultural aspects of the TC modality reinforce these positive attitude changes even after an offender is released. Individuals who have successfully completed substance abuse treatment have reported feeling more optimistic and positive about their prospects for community re-entry (Visher & O'Connell, 2012; Stevens, 2012). These positive treatment outcomes and long-term desistance from drug use greatly reduce an individual's risk for recidivism. For example, according to the BJS, between 2007 and 2009 drug-dependent probationers were 53% more likely to be re-arrested than probationers who were not drug-dependent (Bronson, Stroop, Zimme & Berzofsky, 2020).

The National Institute of Justice’s Crime Solutions rates corrections-based TCs, a common modality for treating SUD within a correctional setting, as a “promising” method of reducing recidivism (Office of Justice Programs, 2022). One systematic review of TCs found that the average overall effect of TC participation was between a 15% to 17% reduction in

recidivism and drug relapse (Mitchell, Wilson & Mackenzie, 2007). Among the studies examined in this review, TCs were found to have a moderate, consistent reduction in recidivism and drug relapse. When compared to other treatment modalities, such as group counseling, boot camps, and narcotic maintenance programs, TCs consistently maintained better outcomes. It was also found that when the TC modality was applied to other populations (i.e., not drug-dependent offenders), similar successes could be observed, suggesting that the TC modality could be applied to a wider range of criminogenic risks/needs among offenders and still produce positive outcomes ((Mitchell, Wilson & Mackenzie, 2012). Another recent meta-analysis found that prison-based substance abuse treatments such as group counseling, individual counseling, 12-step programs, and cognitive-behavioral Therapy (CBT) reduced recidivism by 4% to 9% when looking at a two-year follow-up period (Byrne, 2020). Another evaluation of an evidence-based TC program found that participation reduced rearrest, reconviction, and reincarceration for new offenses. The author of this study found that between four to five months of treatment was the most effective treatment dose (Clark, 2022). Effective SUD treatment does not end when the offender completes their period of incarceration. To be effective, the treatment should also be sustained after release through participation in community-based wrap-around services (National Institute on Drug Abuse, 2014).

Drug Use, Criminal Behavior, and Recidivism

Drug use in the U.S. has a clear effect on offending patterns and recidivism rates. Drug-dependent offenders who do not receive adequate substance abuse treatment with after-care services have been found to be at a higher risk of reoffending. For example, in 2012, as many as 68% of drug-involved offenders were rearrested within three years of release (Belenko, Hiller, & Hamilton, 2013). A 2019 study found that the odds individuals with a SUD will commit a crime

were 2.8 to 3.8 times higher than for individuals without SUD. In addition, these offenders were at a much greater risk of reoffending after being arrested just once (Houser, Saum, & Hiller, 2019). In a recent study, post-release data were examined for trends in recidivism among offenders diagnosed with the following: mental illness, substance abuse disorders, both, and neither. The authors found that both offenders with mental illness, but no substance abuse disorder, recidivated similarly to those with neither mental illness nor substance abuse disorder (Zgoba, Reeves, Tamburello & Debilio, 2020). Offenders with SUDs were found to recidivate at much higher rates and were at a much higher risk of recidivating than any other group of offenders in this study (Zgoba, Reeves, Tamburello & Debilio, 2020).

National data suggest that 39% of state prisoners and 31% of federal prisoners reported being under the influence of drugs at the time of their committing offense. Around 20% (21% among federal prisons and 20% among state prisoners) reported being under the influence of marijuana, while less than 5% reported being under the influence of heroin (Maruschak, Bronson & Alper, 2021). In addition, 35% of state prisoners convicted of a violent crime reported being under the influence of some substance (drugs or alcohol) at the time of their offense, while over 50% of offenders convicted of property or drug offenses reported being under the influence of drugs or alcohol at the time, they committed their offense. Conversely, Maruschak and colleagues (2021) found that more violent offenders (34%) reported being under the influence of only alcohol during the commission of their offenses than property (24%) or drug (22%) offenses. Among federal prisoners, authors found the opposite relationship between substance use and offending. While 41% of federal prisoners sentenced for a property offense reported being under the influence of substances at the time of their offense, about a quarter of offenders sentenced for violent (25%) or drug (26%) offenses reported being under the influence of

alcohol. Moreover, 38% of federal prisoners convicted of a drug offense reported being under the influence of drugs at the time of their committing offense, while only 29% of prisoners convicted of a violent offense reported drug influence (Maruschak & Buehler, 2021). More than 50% of state prisoners convicted for property, drug, and public order offenses meet diagnostic criteria for SUD based on their drug and alcohol consumption histories and patterns, but only 42% of violent offenders met the same diagnostic criteria. In federal prisons, 28% of property offenders and 24% of drug offenders met the diagnostic criteria for a SUD, while 43% of violent offenders met this same criterion (Maruschak & Buehler, 2021).

These data illustrate the relationship between substance use and offending but should not lead practitioners and researchers to believe that any individual under the influence of substances will inherently commit a crime. Instead, these data should guide practitioners to understand that SUDs are strong risk factors for criminality. A better understanding of this relationship can help practitioners and researchers tailor programming to fit this population's unique treatment and reentry needs.

The substance abuse literature suggests that both general and violent criminal behavior can be linked to substance use or abuse. Dowden and Brown (2002) utilized meta-analytical methods to examine the ability of substance abuse factors to predict general and violent recidivism. Five predictor categories were selected: alcohol abuse problem (current or previous), drug abuse problem (current or previous), alcohol and/or drug problem, substance abuse charge, and parental substance abuse. Out of these five predictor categories, the ‘drug and/or alcohol’ category demonstrated the highest level of predictive strength for both general and violent recidivism. This was followed by the exclusive drug abuse predictor. These results show that,

when examining violent recidivism, drug, and alcohol abuse were equally predictive (Dowden & Brown, 2002).

Previous research has suggested that a high rate of substance abuse disorders and illegal drug use significantly affects the high recidivism rates among inmates released in Illinois (Olson & Rozhon, 2011). In addition, in 2016 the Illinois Sentencing Policy Advisory Council reported that, only 11% of convictions resulting in a prison sentence involved individuals with no prior criminal history. The same report found that almost 40% of offenders in Illinois recidivate within three years of release, including adult probationers with felonies or misdemeanors and adults released from prison after being convicted of a felony. Illinois's high rates of recidivism are costly; on average, one recidivism event is estimated to cost the state $151,662. This figure also includes more than $50,000 per offender paid by Illinois taxpayers (Sentencing Policy Advisory Council, 2018).

Risk Needs Responsivity

The Risks-Needs-Responsivity (RNR) model for offender assessment and treatment, based on general personality and Cognitive Social Learning Theory, states that an individual's risk level and unique needs should determine what interventions are appropriate for their individual criminogenic factors (Andrews, Bona & Hoge, 1990). Social earning theory states that behavior is learned by observing and then mirroring the behavior of those around us. When a group rewards a certain behavior the group members are more likely to continue the behavior. Cognitive Social Learning Theory is especially applicable to anti-social communities, such as individuals who have committed criminal offenses or those who use drugs. In these subgroups, peer encouragement may cause an individual to continue offending or using drugs due to the positive reactions these behaviors garner from the group as a whole (Bandura & Walters, 1977;

Niaura, 2000). Conversely, this theory of social learning can be applied to assist an individual in desisting from anti-social and illegal activities in a similar fashion, by providing the individual with a group of pro-social individuals whose positive behaviors can be mirrored and reinforced.

The RNR model provides very specific guidance regarding who should be offered more intensive rehabilitative services (determined by the risk principle), what are the most appropriate service goals for purposes of an ultimate reduction of re-offending (based on the criminogenic need principle), and what styles, modes, and strategies of intervention are best employed (determined by the general responsivity and specific responsivity principles) (Andrews & Bonta, 2015). Andrews and Bonta (2015) argue that appropriately accounting for the risk, need, and responsivity principles when working with offenders will elicit the most effective behavior changes.

These three core principles for efficient treatment should be applied to a carceral environment. The risk principle states that criminal behavior can be predicted. To bridge the gap between assessment and effective treatment, the level of intervention should be matched to the offender's individual risk level. For example, a higher-risk offender likely necessitates more intensive interventions if the goal is a notable reduction in recidivism, while low-risk offenders are more likely to be successful and not re-offend with minimal or no intervention. This principle often goes against human nature; most practitioners prefer to work with motivated low-risk clients who will actively participate in their treatment. Rarely do practitioners want to work with higher-risk, resistant clients who may not be motivated to participate in their own treatment (Andrews & Bonta, 2015).

Risk levels have been found to influence overall recidivism rates. Based on the RNR model, low-risk offenders should be excluded from most intensive interventions and programs.

When low-risk offenders are included in interventions intended for or alongside high-risk offenders, the recidivism rates for those low-risk offenders are found to increase. When high-risk offenders are appropriately matched to programming significant reductions in recidivism can be observed (Bonta, Wallace-Capretta & Rooney, 2000; Lowenkamp & Bechtel, 2007).

The second core principle is criminogenic need. This principle highlights the difference between criminogenic and non-criminogenic needs. Criminogenic needs are dynamic risk factors that, when addressed, can result in an overall change in recidivism rates. Non-criminogenic needs, although likely still dynamic, are not significantly related to recidivism. If the practitioner's goal is to reduce overall reoffending, RNR dictates that interventions should target the offender's dynamic criminogenic risk factors (Andrews & Bonta, 2015).

The final core principle is that of responsivity. This final core principle builds off the preceding two principles, suggesting that the treatment provided should be responsive to both an individual's static risk factors and dynamic needs. This principle can be further segmented into two types of responsivity: general and specific. Social Learning Theory and Cognitive Behavioral Therapy style interventions are important parts of general responsivity. Specific responsivity guides practitioners further to be cognizant of context when implementing interventions. This includes not only utilizing assessments to help match appropriate interventions and treatment styles to individuals but also making modifications to the selected treatment style to further fit the individual (Andrews & Bonta, 2015). Adhering to the core RNR principles is essential for long-term efficacy in treatment. The Therapeutic Community treatment modality is one that has often been successfully adapted for incarcerated populations and adheres to the RNR principles.

Age is an important factor to consider when applying the RNR model. Many studies evaluating the RNR model, and its application in correctional settings, focus on the effect age has on treatment outcomes. For example, many studies have found that more successful treatment outcomes can be observed in older offenders (Piquero, Jennings, & Barnes, 2012; Mikolajewski, Allan, Merrill, Carter & Manguno-Mire, 2021; Dufour, Chouinard-Thivierge & Lussier, 2023).

Overview of Prison-Based Therapeutic Communities

While individual Therapeutic Communities (TCs) program structures vary, several components remain constant across all programs. Corrections-based TCs consist of separate residential drug treatment programs within prisons or jails. These programs are housed separately from the general population in order to maintain a drug-free and pro-social environment. TCs do not focus solely on recovery; rather, they place emphasis on overall pro-social lifestyle changes. The underlying theory behind this modality is that recovery from substance abuse and dependence involves not only rehabilitation but also learning healthy foundational behaviors that become integrated into the individual's daily life (Burdon, Farabee, Pendergast & Messina, 2002; Center for Substance Abuse Treatment, 2005; Mitchell, Wilson & MacKenzie, 2012; National Institute on Drug Abuse, 2020).

TCs emphasize community accountability, which is the main method of making and maintaining these lifestyle changes. This accountable community includes both the facilities' staff and the inmate's peers. Traditionally, TC staff comprises former inmates and individuals in recovery themselves; these individuals serve as positive role models for the residents throughout the program (Burdon, Farabee, Pendergast & Messina, 2002). Best practice guidelines suggest that between 25% to 50% of program staff should have a history of SUDs and at least two years

of continual sobriety (Center for Substance Abuse Treatment, 2005). By hiring staff with SUD and offending histories, the goal is to provide program participants with peer-like role models and mentors while they go through the program. By employing a mixture of mental health practitioners and former TC participants as staff, the goal of TCs is to build a community in which participants feel safe enough to be vulnerable with both the staff and their peers. TC program participants are encouraged to support their peers' positive actions, while also holding them accountable for their negative actions (Wiese, 2019). This central tenet is based partially on Social Learning Theory, which details how behavior is learned through observation and mirroring of others (Bandura & Walters, 1977).

Across most TC programs, residents are expected to participate fully in the programming as a condition of living on the unit. This includes all unit activities such as meetings, group counseling, games, etc., as well as around 4-5 hours of individual treatment per week (Office of Justice Programs, 2015). Residents in these communities are involved in the day-to-day running of the unit. Each resident is assigned chores and jobs on the unit based on their position in the program. The guiding philosophy of this modality is that drug abuse and dependence are symptomatic of more general disorders and life stressors. Due to this guiding philosophy, the treatment focuses on underlying risk factors such as mental health issues, not solely on drug abuse (Mitchell, Wilson & Mackenzie, 2012). A stepping-stone model is often used to guide offenders through the program. Throughout their time enrolled in the TC, offenders will progress through several levels of treatment. As they do so, the offender earns new levels of responsibility and privileges within their community.

Most TCs contain three stages: induction and early treatment, primary treatment, and reentry. During the first stage, the offender is introduced to the TC rules, procedures, and

community members. Offenders begin participating in the TC program and integrate into the social community. The second stage, primary treatment, necessitates offenders focus on changing attitudes and working to curb maladaptive behavior. Often this second stage includes participation in Cognitive Behavior Therapy (CBT) and Motivational Interviewing, support for medical and mental health needs, and engaging with familial support. This stage of the TC modality is unique, as it encompasses many other treatment styles and modalities. This allows the TC modality to be especially sensitive to the RNR model. In this stage, treatment methods can be adapted in response to the unique needs and risk levels of the current participants. Elements of CBT are commonly integrated into TC programming, integrating these elements into TCs teaches participants how to investigate their feelings and actions and teaches methods to desist from future offending.

In the third stage, reentry, the offender prepares for discharge and the transition from the residential portion of the program to the aftercare portion. In this stage, facility staff will help the offender plan and connect with aftercare services in their home communities. Aftercare and relapse prevention are key priorities of this third treatment stage. Participation in aftercare may be the most important TC stage for long-term reductions in recidivism and substance use. Many studies have found that offenders who participated in only a residential TC program had recidivism rates similar to those who did not participate in SUD treatment, but that those who participated in SUD treatment and aftercare had statically significantly lower rates of recidivism than both groups (Mitchell, Wilson & Mackenzie, 2012).

Importance of Aftercare

Aftercare services are one of the most important components of the TC modality. These services support the offender with their reentry by connecting them with services in their home

community. For corrections-based SUD treatment to be effective, it should begin during the offender's period of incarceration and continue post-release. Sustained aftercare services have been found to significantly increase the efficacy of residential SUD treatment. Often, the importance of aftercare services is overlooked, or TC programs struggle to implement this third stage of treatment with high levels of fidelity (National Institute on Drug Abuse, 2020).

Many studies evaluating the importance of aftercare for TC participants have found that those who completed aftercare were significantly less likely to re-offend than those who did not participate in TCs while incarcerated. Offenders who participated in corrections-based SUD treatment with post-release aftercare services were consistently found to have lower rates of recidivism and relapse (Olson & Lurigio, 2014; Staton-Tindall, Harp, Winston, Webster & Pangburn, 2009). Importantly, a study examining the relationship between program implementation and program integrity of community corrections residential treatment programs found that higher levels of program integrity were strongly correlated to greater reductions in recidivism (Lowenkamp, Latessa, & Smith, 2006). Another study found that TC participants who participated in and completed an aftercare program had significantly longer time at risk, meaning they avoided re-arrest for longer than those who did not successfully complete an aftercare program. These positive reductions in recidivism were found for both high and low-risk offenders (Wiese, 2022). It has also been observed that those individuals who participated in TCs but did not complete aftercare had a similar likelihood of reoffending as those who did not participate in a TC (Hiller, Knight & Simpson, 2006).

The importance of aftercare has also been observed in emerging adult populations. A meta-analysis evaluating the effect of aftercare services on recidivism for emerging adults in existing correctional institutions reinforced this importance. This study found that for emerging

adults, aftercare participation significantly reduced long-term recidivism rates. In addition, the study found that aftercare programs had the most impact on high-risk offenders, consistent with the RNR model (James, Stams, Asscher, Roo & Laan, 2013). Another study found that for emerging adults exiting residential SUD treatment, participation in aftercare support, such as a 12-step program, increased the future odds of abstaining from drug use by about 1.3. Those who participated in more than five types of aftercare support (such as engaging with a sponsor, medically assisted treatment, or professional recovery support) increased the future odds of abstaining from drug use by about 3.2 (Bergman, Hoeppner, Nelson, Slaymaker, & Kelly, 2015).

TC Implementation Issues and Program Fidelity

Successfully integrating TCs into correctional settings while still adhering to program fidelity can be a challenge. Correctional institutions view drug use as criminal, their main goal is to curb use by imposing punishments and sanctions intended to deter future criminal behavior. In contrast, treatment programs view drug abuse as a chronic health disorder; their main goal being a reduction in drug use in order to improve an individual's physical and mental health (Burdon, Farabee, Prendergast & Messina, 2002). This makes implementing SUD treatment within a carceral environment inherently difficult. TC programs must operate within the correctional institutions, and often the goals of the institution usurp the goals of the treatment program.

One core TC component is the ability to house participants in an area separate from the prison's general population. TCs rely heavily on cultural milieu to reinforce skills and expectations within the program. The community, comprising of participants and treatment staff, is often described as the main facilitating factor for the social, behaviors, and psychological changes throughout TC participation (De Leon, 2000). It becomes incredibly difficult to foster this community and implement this core TC component with fidelity if TC programs are not

appropriately resourced. Given that treatment programs operate within correctional institutions, the correctional institution is responsible for allocating funding and resources to the treatment programs. In some correctional institutions, it may be difficult to allocate the extra space needed to run these programs separately from the general population. This is especially true for facilities dealing with overcrowding and staffing deficits. One evaluation, focusing on residential SUD treatment for state prisoners across the U.S., found that the most common implementation issues were the inability to find or construct appropriate program facilities and finding appropriately qualified treatment staff. It was observed that in some cases, facilities with extreme overcrowding issues moved individuals from the general population into TC housing dorms with open beds. The same evaluation also found that of the programs it evaluated, 55% lacked one or more key operational treatment components (Harrison, 2003).

The ability to find and retain appropriate treatment staff is often a major barrier to implementing corrections-based TC with high levels of fidelity. The modality requires treatment staff to comprise a mixture of practitioners trained in the TC modality or CBT, social workers, educational professionals, and TC graduates. Employing TC graduates who have successfully completed SUD treatment and continue to live a drug-free life is important to the TC modality. These past participants act as peer mentors and numerous program evaluations have found that their presence significantly increases the effectiveness of this modality. This program component quickly becomes difficult to implement, as many correctional facilities do not allow individuals with criminal records to work within or even visit the facilities (Harrison, 2003). In addition, many programs have issues with staff retention as a whole. High rates of turnover and inexperienced staff make it difficult for TCs to effectively implement the services and programming that are planned or even required by the modality. Corrections-based TC

counselors and staff experience many pressures that other counselors do not, such as potentially hazardous work conditions and frequent staff turnover. TC staff are not often given appropriate compensation for the work they do. Without sufficient pay, it is likely impossible for programs to hire and retain quality staff. (Burdon, Farabee, Prendergast & Messina, 2002). A major reduction in the quality or quantity of staff makes it difficult to implement the unique and specific components of programming with fidelity (Harrison, 2003).

To maintain strong TC program fidelity, programing, and staff must remain as consistent as possible. It has been shown that frequent staff turnover has detrimental effects on TC program fidelity. Furthermore, a lack of consistency in program implementation and staffing does not allow participants to feel safe fully participating in programming, leading to a reduction in the intended programming outcomes such as reductions in recidivism and substance use (Burdon, Farabee, Prendergast & Messina, 2002). It is not uncommon for correctional facilities to contract with outside companies to run and manage programming within their facilities, including TC programming. Occasionally these contracts expire, and vendors change. Major disruptions, such as a change in service providers, make adherence to program expectations with fidelity increasingly difficult (Hiller, 2023). Research suggests that to mitigate disruption in programming when changing providers, staff retention becomes paramount to the successful adherence to program fidelity. If staff can be retained throughout vendor shifts, pre-existing staff can use their therapeutic alliances with the offenders to aid in the transition (Saum, O'Connell, Martin, Hiller, Bacon, & Simpson, 2007, Hiller, 2023).

As dictated by the RNR model for offender treatment, for treatment to be effective it must be responsive to the unique needs and risk factors of the individual. Harrison (2003) found that many of the observed programs lacked valid and reliable assessment and screening tools.

The observed programs often made inappropriate referrals, which led to further program fidelity issues. The authors observed that some offenders were referred to the TCs with too much time left on their sentence, meaning they were returned to the general population after they completed the TC programming. Conversely, other offenders were referred with too little time left on their sentence, meaning they were released before completing the TC program (Harrison, 2003).

Lack of aftercare is another common concern when discussing TC program fidelity. Along with appropriate staffing and housing, aftercare participation is a core component of the modality. Once an offender exits the residential setting of a correctional facility it becomes much more difficult for program staff to encourage them to participate in aftercare. Some TC programs attempt to ensure participation in aftercare by utilizing either work release, halfway house, or parole-supervised treatment (Harrison, 2003). The continuity of care that is achieved when offenders participate in aftercare programming has been found to significantly reduce the participant's recidivism and future substance use when compared to TC participants who did not complete aftercare programming. Some studies even found that those who participated in corrections-based TCs without participating in aftercare had similar long-term recidivism and substance use patterns to offenders who did not participate in any treatment while incarcerated (Harrison, 2003).

The benefits of both the TC modality and its associated aftercare programs cannot be observed without proper implementation fidelity. To ensure this these programs are being implemented with high levels of fidelity, researchers must have a standard way to measure implementation. The Survey of Essential Elements Questionnaire (SEEQ) is one method of measuring program fidelity within TCs. This instrument includes 139 self-report items aimed at evaluating how closely a specific TC program adheres to the theoretical framework of the

modality. These 139 items are divided into six general categories that describe the core elements of the TC modality, each with more specific subcategories under them. See Table 2 for a list of the six general categories and their subcategories or domains (De Leon & Melnick, 1993; Melnick & De Leon, 1999). This assessment tool has been successfully used to evaluate program fidelity adherence primarily in community-based TCs (Melnick, De Leon, Hiller & Knight, 2000), future research should apply the SEEQ to corrections-based TCs as well.

Table 2. SEEQ Categories

Category	Domains
TC Perspective	1. View of Addictive Disorders 2. View of the Addict 3. View of Recovery 4. View of Right-Living
The Agency: Treatment Approach and Structure	1. Agency Organization 2. Agency Approach to Treatment 3. Staff Roles and Functions 4. Client's Role and Functions 5. Health Care
Community as Therapeutic Agent	1. Peers as Gatekeepers 2. Mutual Help 3. Community Belonging 4. Outside Community Contact 5. Community/Clinical Management- Privileges, Sanctions and Surveillance
Educational and Work Activates	1. Formal Education Elements 2. Therapeutic-Educational Elements 3. Work as Therapy
Formal Therapeutic Elements	1. General Therapeutic Techniques 2. Groups as Therapeutic Agents 3. Counseling Techniques 4. The Role of the Family
Process	1. Stages of Treatment 2. Introductory Period 3. Primary Treatment Stage 4. Community Re-Entry Period

Cost-Benefit Analysis

Both drug use and criminal behavior place large final burdens on society. For example, in 2007, it was estimated that the cost of drug use on society was $193 billion, with $113 billion of that associated with drug crimes. In the same year, the cost of treating individuals with SUD, including healthcare costs, and government-sponsored treatment, was around 14.6 billion (National Institute on Drug Abuse, 2020). Criminal justice and health care systems are often greatly understaffed and underfunded, making them less effective. Therefore, any method of reducing these financial strains while also improving treatment outcomes should be investigated.

TCs, and corrections-based treatment in general, have been found to be a cost-effective method of reducing recidivism, especially when compared to incarceration without treatment (Griffith, Hiller, Knights & Simpson, 1999; Harrison, 2003; McCollister, French, Prendergast, Wexler, Sacks & Hall, 2003; Drake, 2012). Compared to other residential treatment modalities, research has shown that staffing a TC program costs considerably less. This is due to the unique mix of mental health practitioners, educational staff, and TC graduates that a TC requires (Harrison, 2003).

A 2012 cost-benefit analysis found that substance abuse treatment for offenders, both in the community and in correctional settings, reduces recidivism between 4% and 9%. As of December 2012, SUD-specific TCs in correction settings were found to produce a net value of $6,795 per participant or a benefit-to-cost ratio of $2.59. Meaning that for every dollar invested in TC programming, there was an estimated $2.59 benefit to society. These net positive benefits could include improvements to offenders' mental and physical health, reduction in criminal justice-related costs, and increased participation in the workforce. Taxpayers are estimated to

benefit around $2,000 per TC participant. These cost savings could be in many forms such as improvements to public services or improvements to local economies (Drake, 2012).

A similar study looking at TCs within California state prisons found the average cost of treatment to be around $4,000 per individual. Individual participation in these programs resulted in an approximate 36% reduction, or 51 days less, in incarceration. (McCollister, French, Prendergast, Wexler, Sacks & Hall, 2003). As is expected, based on the RNR model, the cost-effectiveness of TCs was greater for high-risk individuals. A 1999 cost-benefit analysis of prison-based TC found that for low-risk paroles who completed after-care costs approximately $500 to reduce recidivism by 1%. To achieve the same reduction in recidivism for high-risk paroles who completed aftercare, scholars found it would cost approximately $165 (Griffith, Hiller, Knights & Simpson, 1999).

In the state of Illinois, the TC treatment modality has been used to reduce the costs associated with incarcerating offenders with SUDs. The Illinois Budgeting for Results (BFR) completed an assessment of IDOC TCs to evaluate the success of these programs at reducing costs. Part of this assessment included the completion of a cost-benefit analysis specifically of the TC programs at Sheridan Correctional Center and Southwestern Illinois Correctional Center. BFR found that for every $1 IDOC spent on TC programming, a future benefit of $1.61 could be observed. These future benefits could be observed by both IL taxpayers and IL crime victims. BFR also determined there was a 91% chance that the benefits from these programs would exceed the costs (Illinois BFR, 2022).

CURRENT STUDY

The current study aims to evaluate corrections-based SUD TCs within the IDOC prison system and their effect on both general and specific recidivism. Guided by previous correctional and SUD treatment research, this study attempts to answer the following questions:

Research Questions

1. Does individual participation in substance use disorder treatment, specifically within a TC modality while incarcerated reduce post-release recidivism rates?
2. If so, do emerging adults have a lower likelihood of recidivism, when compared to older adutls, as a result of participating in SUD treatment while incarcerated?

Data

The present study draws from pre-existing Illinois Department of Corrections (IDOC) corrections data obtained by the IDOC and the Illinois State Police (ISP). The file contains case-level information for individuals released from prison in Illinois between July 1, 2010, and June 30, 2015. This dataset contains individual-level information such as general demographics, basic measures of recidivism, an assessment of substance abuse treatment needs, and an indication of substance abuse treatment services. This dataset also includes detailed criminal history and court disposition data, including information on the defendant's charges, criminal statutes violated, and case outcomes (i.e., guilty, dropped, etc.). A majority of the data in this file were collected at the time of intake or during an individual's previous incarceration within IDOC. Most variables originated from self-report measures and information collected by correctional counselors. This file contains information on 153,217 adults.

Sheridan Correctional Center and Southwestern Illinois Correctional Center

The current study's treatment sample comprises men from the Sheridan Correctional Center and the Southwestern Illinois Correctional Center. Sheridan Correctional Center is a medium-security prison and dedicated drug treatment facility that utilizes the TC treatment modality. Located in Sheridan, IL, Sheridan Correctional Center originally opened in 1941 as a juvenile correctional center and was later converted to an adult correctional center in 1973. In 2004, Sheridan Correctional Center re-opened as a dedicated drug treatment facility, with an initial capacity of 950 inmates. Sheridan Correctional Center's initial capacity of 950 grew to an operational capacity of 2,107 beds and a population of 1,036 adult men (as of June 30, 2023). A majority of the offenders placed at Sheridan Correctional Center have been evaluated by correctional staff and found to need substance abuse treatment, although there were select periods of time when general population offenders were held at Sheridan Correctional Center (Illinois Department of Corrections, 2023). These offenders have not been included in the present study as they did not participate in the SUD TC programming. Sheridan Correctional Center is unique in the broadness of its eligibility requirements. The only eligibility requirements are as follows: offenders must be identified as needing substance abuse treatment based on assessment, they must have between 9 and 24 months left to serve on their sentence; they must have the appropriate security level to be placed in a medium security faculty and finally, they must be male. During the period when the first formal evaluation of the Sheridan Correctional Center TC program took place, between January 2004 and December 2008, 3,200 inmates completed the prison phase of Sheridan's program and were released to the aftercare and supervision phase as discussed below (Olson et al., 2009).

The Southwestern Illinois Correctional Center opened in 1995, is a fully dedicated TC for adult men. Southwestern Illinois Correctional Center operates as a minimum-security prison. Southwestern Illinois Correctional Center had an operational capacity of 631 with a total population of 605 (as of June 30, 2023). Southwestern Illinois Correctional Center currently offers individuals educational and vocational training, as well as post-release aftercare services. All individuals housed at Southwestern Illinois Correctional Center are required to participate in SUD group treatment five days a week, for a minimum of 15 hours per week (Illinois Department of Corrections, 2023). Similar to the Sheridan Correctional Center, Southwestern Illinois Correctional Center has broad eligibility requirements. The main difference between the two, however, is that Southwestern Illinois Correctional Center is a minimum security faculty and inmates must have the appropriate security clearance to be eligible (Olson & Rozhon, 2011). BFR found Illinois spends on average, $4,377 per participant for one year of TC programming (Illinois BFR, 2022).

Keeping constant with common TC expectations, all inmates at Sheridan Correctional Center and Southwestern Illinois Correctional Center are expected to participate in programming in its entirety. This includes actively participating in all activities, group therapies (such as anger management, domestic violence groups, cognitive behavior therapy, and dialectical behavior therapy), and unit responsibilities. Included in these required programs is participation in the Inner Circle. The Inner Circle is a group facilitated by the organization Treatment Alternative for Safe Communities (TASC) it provides a set time for program participants to discuss the skills and behaviors they are working on. This non-judgmental peer-focused group aligns with the core TC component of the community as an instrument of change (TASC, 2021). TASC is a community organization that provides direct services, such as substance and mental health

treatment screening and assessment, clinical case management, and treatment and recovery support (TASC, 2018). Inmates in these programs are also required to complete appropriate education and vocational programs to build skills, this aligns with the "whole-body" approach of the TC modality. To ensure the integrity of the programs, failure to comply with the set expectations results in inmates' dismissal from the program and subsequent transfer to a different facility. Both programs run as standard TC programs. The programs have a hierarchical structure, made up of IDOC staff, individuals with a history of substance abuse disorders, and clinicians. Within these facilities, the offenders are further separated into distinct communities or families that are housed in separate contained units (Olson & Rozhon, 2011; Olson et al., 2009, Illinois Department of Corrections, 2023).

Post-release aftercare is another key aspect of the TC treatment modality. Inmates who complete either the Sheridan Correctional Center or the Southwestern Illinois Correctional Center's TC programming, enter the aftercare and supervision phase of treatment. Leading up to an inmate's release, they meet with a team of practitioners to prepare for post-release life. Aftercare services are coordinated by clinical case managers working with the TASC organization. TASC utilizes the Specialized Case Management model to assist individuals exiting these TC programs in reentering the community. TASC's aftercare services begin before the individual has left prison. The goal is to match the individual with aftercare services that are geographically accessible and appropriate to their level of need upon exiting the prison-based TC program. By beginning aftercare planning while the individual is still incarcerated, practitioners can reduce, or eliminate, the gaps between interventions. TASC clients are provided support that focuses on five major categories upon reentry. First, the individual's basic needs are addressed. TASC operates on a "housing first" approach, prioritizing stable housing so that the individual

has a safe foundation for continued reentry and recovery. In addition to stable housing, this first phase involves connecting clients with SNAP benefits and food assistance. Second, clients are provided with comprehensive clinical assessments in an effort to individualize healthcare treatment. This may include referring clients to additional SUD treatment, mental health treatment, or medication-assisted treatment (MAT). The next step addresses employment, clients are connected with community resources that assist with job-seeing and skill-building. Family needs are also an important consideration for TASC's clients. TASC assists clients with children in navigating the reunification process to rebuild a client's family unit. (TASC, 2021; Olson & Rozhon, 2011; Olson et al., 2009).

In addition to the aforementioned aftercare services TASC provides, they also focus on peer-driven recovery support. Similar to the positive peer community structure of the TC's Inner Circle, the Winners' Circle provides clients in the community a non-judgmental space for support. These meetings, which are facilitated by trained TASC staff members, occur at many locations across Chicago, IL. At Winners' Circle meetings, clients learn skills and behaviors to aid in their reentry, in addition to reinforcing the skills and behaviors learned during their TC participation. These meetings encourage clients to continue to lead pro-social lives, including remaining drug and crime-free and building interpersonal bonds. The structure of these Winners' Circles meetings mirrors the structure of the Inner Circle meetings clients are familiar with from their TC program participation. This allows for a more streamlined continuity of care (TASC, 2021).

Sample Description

The full population discussed above contains individual-level data from 153,217 adults. The original file contained many instances of the same individual appearing in the data multiple

times as a result of multiple admissions and exits from the IDOC. To account for these repeated cases, each individual's first chronological exit date in the file (indicating their first chronological exit from IDOC) during the observation period was utilized as their unique admission and exit event. All subsequent admissions and exits from IDOC were likely the result of subsequent recidivism. From the full population, those who were admitted by a judge were selected, which eliminated anyone in the file due to a parole violation. Due to the conceptualization of this study's variables of interest (recidivism within three years and controlling for criminal history), only individuals with at least three years of time at risk (i.e., offenders who had been released from IDOC for at least three years), and the presence of a criminal history record were selected (see Figure 1).

As mentioned above, the present study aims to evaluate the effectiveness of corrections-based TC substance abuse treatment for males at both the Sheridan Correctional Center and the Southwest Illinois Correctional Center. Therefore, the sample was further narrowed down by selecting only male offenders, resulting in a final narrowed population of 63,238 adult men.

Of these 63,238 men, over half were Black, around a third White, and less than 15% were Hispanic. Approximately half of the narrowed population had either some high school education, a high school degree, or a GED. Less than 1% of the population had an undergraduate degree, graduate degree, or technical degree. A majority of the population has never been married, while only 15% of the sample were currently married. Around two-thirds of the population had one or more children, while the remaining one-third had none (Table 3).

Of the 63,238 men selected who exited IDOC during the observation period, only 5,365 individuals received SUD treatment at either Sheridan Correctional Center or Southwest Illinois Correctional Center and were subsequently referred to aftercare at TASC. From these men, 1,300

individuals were eliminated from the treatment group due to insignificant time at risk, meaning there had not been three full years had not elapsed between their initial release from IDOC and when criminal history record checks occurred. This resulted in the final group of 4,065 individuals that received SUD treatment, 1,412 at Southwestern Illinois Correctional Center and 2,653 at Sheridan Correctional Center, during the observation period. To further evaluate the efficacy of these two SUD treatment programs, each correctional center's treatment group was matched with a quasi-experimental comparison group of individuals who, while eligible for treatment, were sent to institutions other than Sheridan or SWICC.

Figure 1. Final Sample Selection Process

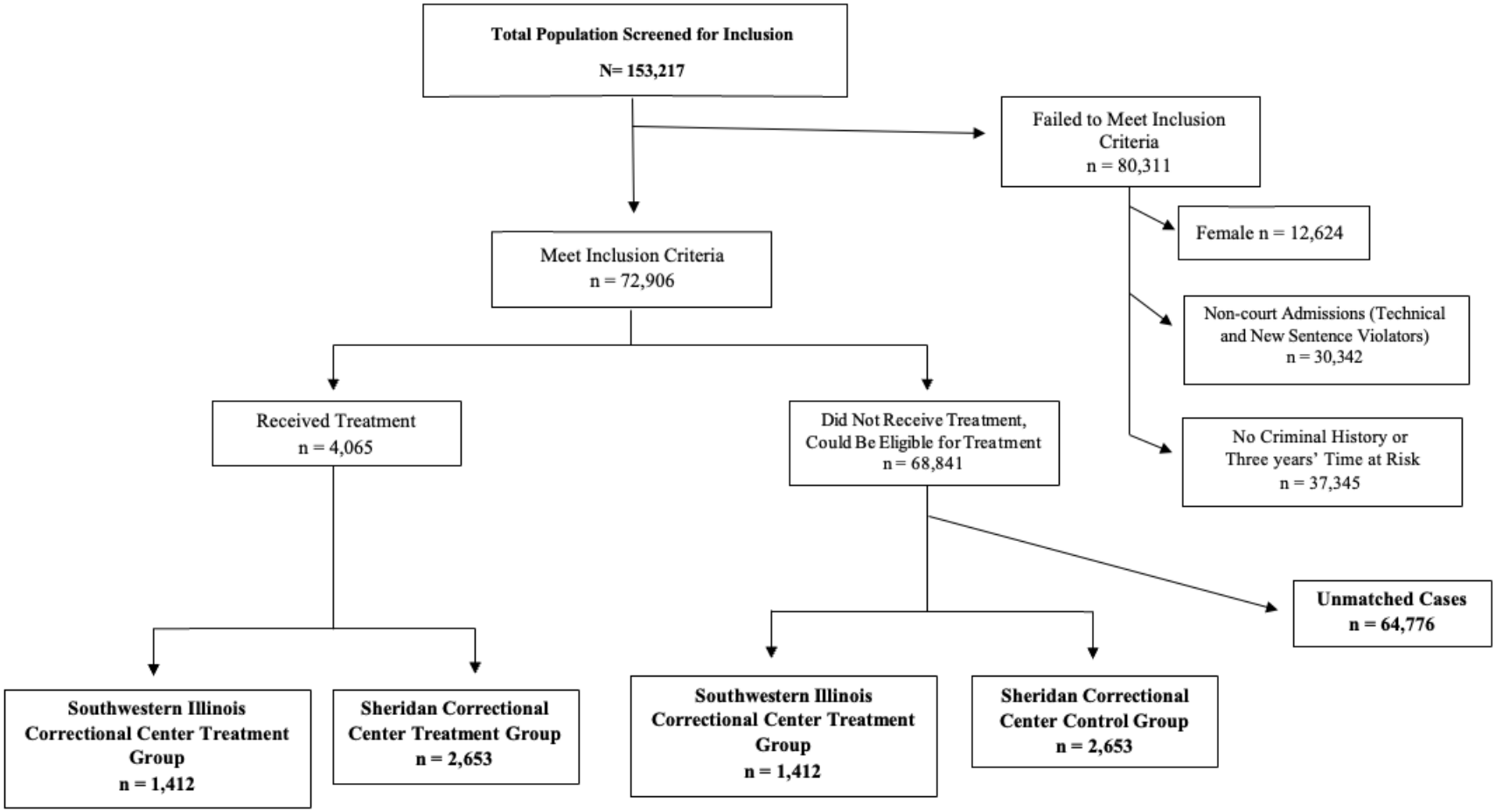


Table 3. Full Population, Narrowed Population, and Treatment Group Characteristics

Characteristic		Entire Population 153,217	Narrowed Population 63,238	Received Treatment 4,065
Age at Exit (Average, Years)		35	34	34
Emerging Adult at Exit (%)	No	73	71	72
	Yes	27	29	28
Sex (%)	Male	92	100	100
	Female	8.2	0	0
Race (%)	White	29	29	33
	Black	59	56	57
	Hispanic	11	14	10
	Other	1	1	<1
Number of Children (%)	No Children	37	38	33
	1+ Children	63	62	67
Education Level (%)	Less than Highschool Degree or GED	46	49	53
	Highschool Graduate, GED or above	51	47	46
	Collage Graduate	1	1	1
	Unknown	2	3	<1
Marital Status (%)	Never Married	73	72	74
	Married	14	16	16
	Married in the Past	9	9	10
	Unknown	3	3	<1
Active Gang Membership Reported (%)	Not Active Member	66	68	58
	Active Gang Member	34	32	42
Arrested Within Three Years (%)	No	60	43	41
	Yes	40	57	59
Arrested Within Three Years for a Violent Offense (%)	No	79	80	83
	Yes	21	20	17
Prior Violent Arrests (%)	0	22	25	24
	1-3	62	48	49
	4-6	12	18	17
	7+	4	19	10
Prior Violent Convictions (%)	0	52	55	54
	1+	48	45	46
Prior Arrests (%)	0-3	12	13	19
	4-6	13	15	15
	7-10	17	18	20
	11-15	17	18	18
	15+	41	36	28
Prior Convictions (%)	0-1	15	18	12
	2-4	37	39	40
	5-7	24	24	26
	8-10	12	11	13
	11 +	12	8	9
Prior Domestic Violence Arrests (%)	No	61	63	61
	Yes	39	37	39
Prior Controlled Substance Arrests (%)	No	72	72	64
	Yes	28	28	36
Prior Firearm Related Arrests (%)	No	78	79	76
	Yes	22	21	24
Original Admission Type (%)	Court Admissions	66	100	100
	New Sentence	7	0	0
	Technical Violators	27	0	0

Characteristic		Entire Population	Narrowed Population	Received Treatment
		153,217	63,238	4,065
At Least Three Years at Risk (%)	No	25	0	0
	Yes	75	100	100
SUD Treatment Participation (%)	No	96	93	0
	Yes	4	7	100
Prior Criminal History (%)	No	1	0	0
	Yes	99	100	100
TCU Scores (%)	No Disorder	45	43	6
	Mild Disorder	12	12	4
	Moderate Disorder	8	9	7
	Severe Disorder	35	36	83
Released to Cook County (%)	No	50	49	51
	Yes	50	51	49
Prior Prison (%)	0	44	49	43
	1	21	19	24
	2+	35	32	33
Days at Risk	(Average Days)	1,490	1,698	1,669

Propensity Score Matching

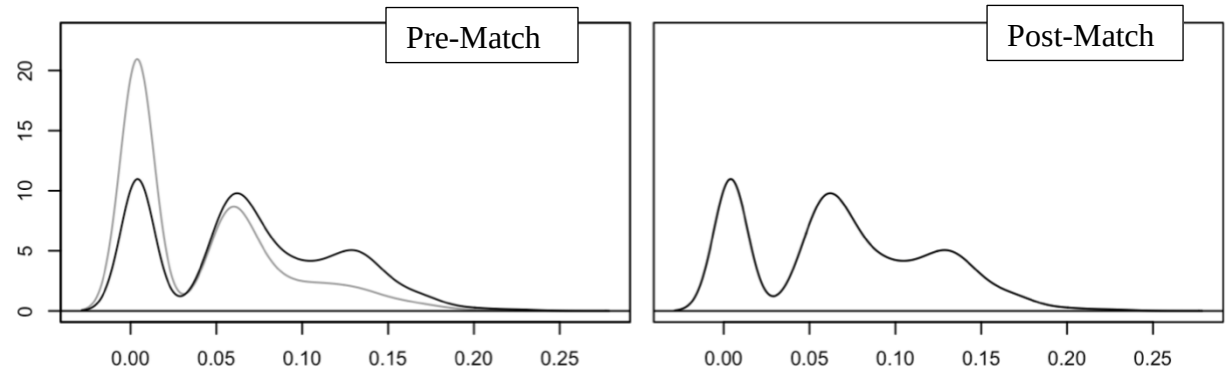
To account for unique differences, such as security classification, between the two SUD TC programs, matched comparison groups were created for both Sheridan Correctional Center and Southwestern Illinois Correctional Center treatment groups. These comparison groups were created utilizing one-to-one propensity score matching to create two equal samples of matched pairs. To effectively create these matched groups, nearest-neighbor matching was performed using the MatchIt package in R. The MatchIt package is an add-on for the programming language R, used to produce parametric and non-parametric statistically matched models. MatchIt was designed to analyze the relationships between a dichotomous treatment variable and pre-treatment control variables. While this package offers many matching methods, the present study employed its “nearest neighbor” method. In this method, propensity scores are calculated for each case, and then the best comparison matches are selected for each individual case in the treatment group. When employing “nearest neighbor” matching, each case in the treatment group is matched with a case from the comparison group that has not yet been matched, while still ensuring the comparison case is the closest match based on the selected distance measure. The

present study utilizes propensity score as its distance measure. When creating matched pairs, the distance measure is the value that is used to create the closest matches between cases in the treatment and comparison groups (Ho, Imai, & Stuart, 2011).

As shown in Figure 1, the comparison groups were comprised of individuals who could have received treatment (i.e., meet the inclusion and eligibility requirements) but did not receive treatment. The final treatment and comparison groups were matched on the following variables: *age at exit*, criminal history measures (*prior arrests, prior violent arrests, prior prison, prior firearm arrest, prior domestic violence arrests, prior controlled substance arrests), active gang membership, race, and drug treatment recommended*. These variables were selected for matching based on multivariate (logistic regression) analysis, used to determine which variables were most strongly associated with both general and violent recidivism.

The results of the nearest neighbor propensity score matching for the entire sample of offenders who received treatment at Sheridan Correctional Center indicate that the treatment and comparison groups are well-balanced. The following density plot (see figure 2) serves to illustrate the balance of the samples pre- and post-matching. Prior to the matching process, the standardized mean difference (0.5336), and variance (1.2618) of propensity scores were un-matched. After completing the matching process, the standard mean difference (0), and variance (1) of propensity scores were increasingly well-balanced. A variance ratio closer to one and a standard mean difference closer to zero indicate the two samples are very well matched. Post-match, the standard pairwise distance, which measures the balance within the matched pairs, was zero. Both the Sheridan treatment and comparison groups had 2,653 individuals (table 4 details the characteristics of these samples.

Figure 2. Distribution of Propensity Scores – Sheridan Correctional Center



When focusing solely on participants at Southwestern Illinois Correctional Center, the nearest neighbor propensity score matching results indicate that the treatment (Southwestern Illinois Correctional Center only) and comparison groups are well-balanced. The following density plot (Figure 3) serves to illustrate the balance of the samples pre- and post-matching. Prior to the matching process, the standard mean difference (0.4878), and variance (1.4296) of propensity scores were un-matched. After completing the matching process, the standard mean difference (0), and variance (1.0001) of propensity scores were increasingly well-balanced. Post-match, the standard pairwise distance, which measures the balance within the matched pairs, was 0.0001. This reduced sample contained 2,824 individuals, 1,412 of which were in the treatment group and 1,412 in the comparison group, Table 4 details the characteristics of these samples.

Figure 3**.** Distribution of Propensity Scores – Southwestern Illinois Corrections Center

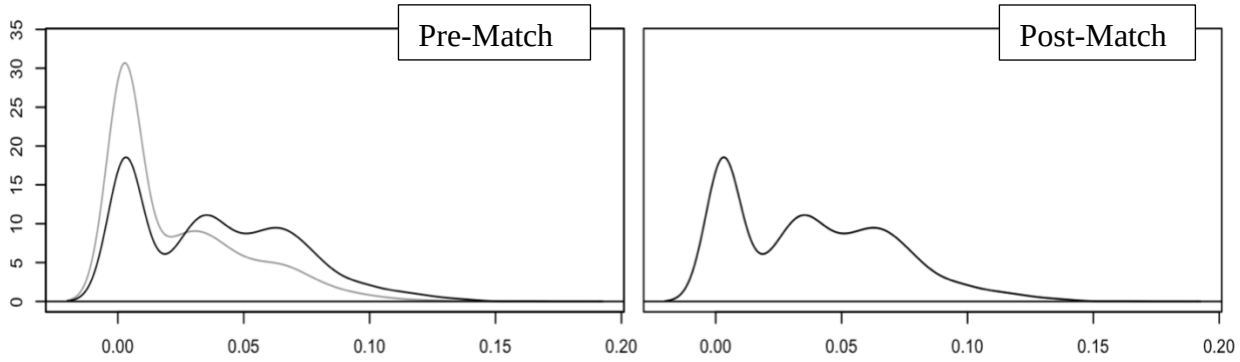


Table 4. Treatment and Comparison Group Characteristics

Characteristic		Sheridan		Southwestern Illinois	
		Treatment	**Comparison**	**Treatment**	**Comparison**
		2,653	2,653	1,412	1,412
Age at Exit (Average, Years)		34	34	35	35
Emerging Adult at Exit (%)	No	71	73	75	72
	Yes	29	27	25	28
Sex (%)	Male	100	100	100	100
	Female	0	0	0	0
Race (%)	White	25	25	49	38
	Black	63	62	47	51
	Hispanic	12	13	4	10
	Other	<1	<1	<1	1
Number of Children (%)	No Children	33	36	32	36
	1+ Children	67	64	68	64
Education Level (%)	Less than Highschool Degree or GED	46	49	48	47
	Highschool Graduate, GED or above	54	51	52	53
Marital Status (%)	Never Married	76	73	70	72
	Married	16	16	17	16
	Married in the Past	8	9	13	11
	Unknown	<1	2	<1	1
Active Gang Membership Reported (%)	Not Active Member	51	63	71	72
	Active Gang Member	49	37	29	28
Arrested Within Three Years (%)	No	38	42	42	43
	Yes	62	58	58	57
Arrested Within Three Years for a Violent Offense (%)	No	82	79	84	80
	Yes	18	21	16	20
Prior Violent Arrests (%)	0	21	24	30	28
	1-3	51	48	48	49
	4-6	18	19	16	14
	7+	10	9	6	9
Prior Arrests (%)	0-3	19	22	19	21
	4-6	13	13	19	18
	7-10	18	18	23	21
	11-15	18	17	18	17
	15+	32	30	21	23
Prior Convictions (%)	0-1	11	16	14	18
	2-4	39	38	43	41
	5-7	26	24	25	24
	8-10	14	14	11	10
	11 +	10	8	7	7
Prior Domestic Violence Arrests (%)	No	61	63	59	63
	Yes	39	37	41	37
Prior Controlled Substance Arrests (%)	No	62	67	66	72
	Yes	38	33	34	28
Prior Firearm Related Arrests (%)	No	73	78	83	83
	Yes	27	22	17	17
Original Admission Type (%)	Court Admissions	100	100	100	100
	New Sentence	0	0	0	0
	Technical Violators	0	0	0	0

Characteristic		Sheridan		Southwestern Illinois	
		Treatment	Comparison	Treatment	Comparison
		2,653	2,653	1,412	1,412
TCU Scores (%)	No Disorder	4	36	4	33
	Mild Disorder	2	12	3	13
	Moderate Disorder	6	11	8	11
	Severe Disorder	88	41	85	43
SUD Treatment Recommended (%)	No	5	5	6	6
	Yes	95	95	94	94
Released to Cook County (%)	No	45	44	64	64
	Yes	55	56	36	36
Prior Prison (%)	0	41	41	47	47
	1	24	24	25	24
	2+	35	35	28	29
Days at Risk	(Average Days)	1,651	1,651	1,703	1,702

METHODS

Description of Variables

Dependent Variables

In the present study, the main dependent variable of interest is recidivism. Guided by current recidivism research and the current IDOC definition of recidivism, the present study uses a three-year follow-up period. The dependent variable is dichotomous wherein 1 indicates an individual had been arrested within Illinois at least once for a violent offense in the three years following their initial release from prison, and 0 indicates the individual had not been re-arrested within that period. These violent offenses include the following: murder, nonnegligent manslaughter, rape, sexual abuse, domestic battery, robbery, simple assault, and aggravated assault. In addition, I also assessed post-release arrest for any offense, as a dichotomous variable wherein 1 indicates an individual had been arrested in Illinois at least once for any offense in the three years following their initial release from prison, and 0 indicates the individual had not been re-arrested in Illinois within that period. These arrests do not include returns to IDOC for technical or parole violations.

Independent Variable

The main independent variable in this study is incarceration at and release from the Sheridan or Southwestern Illinois Correction Center with a referral to aftercare, indicating they participated in a corrections-based TC. This is a dichotomous variable, 1 indicates an individual participated in substance use disorder treatment at either the Southwestern Illinois or Sheridan Correctional Center, and 0 indicates an individual was released from another prison (indicating

they did not participate in either SUD treatment program). In an effort to examine the treatment effect of each addition program, in two of the logistic regression models, the dependent variable was also coded as 0 indicating no treatment participation, 1 indicating participation at Southwestern Illinois Correctional Center, and 2 indicating participation at Sheridan Correctional Center.

Past recidivism research has found that emerging adults, or young offenders, are less susceptible to SUD treatment and corrections-based therapies. In line with this research, both *age at exit* and *emerging adult at exit* were included to evaluate if the same was true for the current sample. The *emerging adult at exit* variable was coded as 1 when the offender was 25 or under (i.e., an emerging adult) and 0 when the individual was over 25 years old. A little less than a third of the final sample were emerging adults (see table 3).

Control Variables. In addition to evaluating the effect age had on treatment magnitude, the following analysis will control for a variety of common variables found to be correlated with recidivism, such as *race, education level, released in Cook County, number of children,* and *marital status*. These variables were included in order to control for factors that could either mitigate or aggravate post-release reoffending as well as SUD treatment efficacity (Table 3).

TCU Scores and Drug Treatment Recommendation. The Texas Christian University Drug Screen (TCUDS) is used to screen individuals who may be in need of substance use disorder treatment in correctional settings. The original TCU Scoring instructions dictate that for items one through nine (Appendix A, Table 1), one point should be assigned for each "yes" response. For items 10 and 11 (Appendix A, Table 1), one point should be assigned for either a "yes" response to a or b. The points will then be summed up, resulting in a score between 0 and 11. For the present study's adaptation, one point was assigned to each "yes" response for items

one through ten, and one point was assigned for a response of "Yes" for either item 11a or 11b. In addition, the variable *drug treatment recommended* was included in order to examine which offenders were recommended for drug treatment upon their prison intake. This variable takes into consideration both the offenders' TCUDS and other factors that may limit their ability to successfully participate in a TC milieu (such as evidence of severe mental illness).

Measures of Criminal History. Multiple variables were used to measure the extent and nature of criminal history, including: total *prior arrests, prior arrests for violent crimes, prior convictions, prior convictions for violent crimes, prior domestic violence arrests, prior firearm arrests, prior controlled substance arrests, prior prison stays, and days at risk between prison exit and when criminal history records were check for recidivism*. These measures of criminal history were included in an attempt to control for a variety of criminal history backgrounds, as well as criminal history backgrounds commonly associated with SUD treatment needs.

Analytical Strategy

The aforementioned samples were evaluated first using descriptive statistics, and with both bivariate analyses and logistic regression to ascertain the effect SUD treatment within carceral settings had on recidivism, as well as the degree to which age mitigated these effects. Bivariate analyses were completed to help determine the existence and strength of the relationship between variables, as well as eliminate variables with high levels of collinearity. The correlations involving the variables *active gang membership* and *prior firearm use arrests* were calculated using Phi (**φ)**, and the correlations involving the *time at risk* variable was calculated utilizing Pearson's R. The bivariate correlation involving all other variable relationships were calculated utilizing Cramer's V. As shown in the correlation matrix (see Table 5), variables included in the final logistic regression models do not exhibit multicollinearity.

Separate comparisons were completed to examine differences in recidivism trends, both all recidivism and violent recidivism specifically, within both correctional facilities (Southwestern Illinois and Sheridan Corrections Centers). Logistic regression models were completed to analyze the effect age had on recidivism trends among those who completed SUD treatment. Finally, recidivism rates for both correctional facilities, both general and violent recidivism, were compared as an additional measure of the effect of SUD treatment participation.

Table 5. Final Sample Correlation Matrix

	Arrested Within Three Years	Arrested Within Three Years - Violent Offense	Age at Exit	Emerging Adult at Custody	Prior Violent Arrests	Prior Arrests	Prior Convictions	Prior Firearm Arrests	Prior Domestic Violence Arrests	Prior Controlled Substance Arrests	Released in Cook County	Days at Risk	Prior Prison	Drug Treatment Recommended	TCU Score	Marital Status	Education Level	Race	Number of Children	Active Gang Membership
Arrested Within Three Years	1																			
Arrested Within Three Years - Violent Offense	0.349**	1																		
Age at Exit	0.1999**	0.179**	1																	
Emerging Adult at Custody	0.144**	0.129**	- 0.618**	1																
Prior Violent Arrests	0.117**	0.174**	0.205**	- 0.133**	1															
Prior Arrests	0.174**	0.074**	0.055**	0.184**	0.152**	1														
Prior Convictions	0.176**	0.047**	0.338**	0.309**	0.418**	0.355**	1													
Prior Firearm Arrests	0.086**	0.065**	0.032**	0.002A	0.282**	0.110**	0.113**	1												
Prior Domestic Violence Arrests	0.059**	0.107**	0.112**	0.169**	0.444**	0.221**	0.295**	0.033**	1											
Prior Controlled Substance Arrests	0.099**	0.012*	0.081**	0.113**	0.054**	0.203**	0.251**	0.055**	0.058**	1										
Released in Cook County	0.166**	0.012*	0.001a	NA	0.086**	0.197**	0.058**	0.080**	0.070**	0.119**	1									
Days at Risk	- 0.066**	- 0.018**	0.027**	- 0.034**	- 0.027**	- 0.011*	- 0.010*	- 0.007a	- 0.128*	0.013*	0.011*	1								
Prior Prison	0.101**	0.010*	0.395**	0.373**	0.296**	0.292**	0.458**	0.169**	0.197**	0.274**	0.060**	0.023**	1							
Drug Treatment Recommended	0.010*	0.008*	- 0.131*	0.027**	-0 .008*	0.044**	0.074**	0.009*	0.024**	0.045**	0.036**	0.038**	0.050**	1						
TCU Score	0.017*	0.014*	0.002a	0.035**	0.003a	0.036**	0.061**	0.039**	0.046**	0.041**	0.100**	- 0.009*	0.054**	0.825**	1					
Marital Status	0.153**	0.088**	0.324**	0.289**	0.018**	0.037**	0.083**	0.047**	0.088**	0.069**	0.139**	0.018**	0.118**	0.162**	0.107**	1				
Education Level	0.057**	0.058**	- 0.095**	0.128**	NA	0.039**	0.083**	0.037**	0.046**	0.060**	0.134**	- 0.009*	0.113**	0.165**	0.108**	0.522**	1			
Race	0.219**	0.080**	- 0.58**	0.050**	0.043**	0.112**	0.101**	0.206**	0.074**	0.250**	0.424**	0.016**	0.157**	0.059**	0.072**	0.142**	0.125**	1		
Number of Children	0.032**	0.034**	0.279**	0.268**	0.124**	0.144**	0.193**	0.041**	0.180**	0.130**	NA	0.048**	0.234**	0.043**	0.053**	0.355**	0.195**	0.104**	1	
Active Gang Membership	0.147**	0.068**	0.009*	0.037**	0.196*	0.215**	0.216**	0.217**	0.038**	0.171**	0.186**	- 0.032**	0.350**	0.033**	0.053**	0.102**	0.107**	0.273**	0.101**	1

*$p \leq 0.05$, **$p \leq 0.01$, *** $p \leq 0.001$

RESULTS

Six models examining the effect of treatment on recidivism were included in the final analysis. These analyses were used to examine how participation in SUD treatment, specifically the modality of a corrections-based TC, affects post-release reoffending, and the effect that emerging adulthood has on treatment efficacy. The first two models examine the effect of SUD treatment participation on post-release reoffending, both violent and general recidivism, using the entire narrowed population. These models utilize multivariate analyses, more specifically logistic regression, to examine this relationship. In addition, recidivism trends for both the treated and non-treated offenders are examined. The last four models examine the effect age at prison exit has on the efficacy of corrections-based SUD treatment, and also utilize multivariate logistic regression to examine this effect. To determine if age had a differential impact on treatment efficiency for different age groups, the treatment coefficients, for emerging adults and older adults, in each logistic regression model (for models 3-6) were compared. This comparison was done by calculating the z scores to determine if the difference in the impact of treatment was different across age groups. Finally, the recidivism rates for both Sheridan and Southwestern Illinois Correctional Centers and their respective comparison groups were examined to further investigate the effect of SUD TC participation on general and specific (violent) recidivism.

Table 6. Final Six Logistic Regression Descriptions

Analysis	Sample	Dependent Variable	Independent Variable	Analysis Method
1	Narrowed Sample	Recidivism: Violent Crimes Arrests within Three years of Release	Substance Use Disorder Treatment Participation	Multivariate – Logistic Regression
2	Narrowed Sample	Recidivism: Any Arrests within Three years of Release	Substance Use Disorder Treatment Participation	Multivariate – Logistic Regression
3	Treatment and Comparison Group (Emerging Adults Only)	Recidivism: Violent Crimes Arrests within Three years of Release	Substance Use Disorder Treatment Participation	Multivariate – Logistic Regression
4	Treatment and Comparison Group (Older Adults Only)	Recidivism: Violent Crimes Arrests within Three years of Release	Substance Use Disorder Treatment Participation	Multivariate – Logistic Regression
5	Treatment and Comparison Group (Emerging Adults Only)	Recidivism: Any Arrests within Three years of Release	Substance Use Disorder Treatment Participation	Multivariate – Logistic Regression
6	Treatment and Comparison Group (Older Adults Only)	Recidivism: Any Arrests within Three years of Release	Substance Use Disorder Treatment Participation	Multivariate – Logistic Regression

Analysis One

The first model examined the relationship between new violent post-release arrests and substance use disorder treatment. Model 1 utilized the entire sample, both individuals who have completed treatment and those who did not but could have been eligible based on their demographic characteristics. Overall, the model was statically significant ($X^2 = 600$, df = 7, $p < 0.001$). Model 1 explained around 13% of the variation in whether the individual experienced a new post-release arrest (Nagelkerke $R^2 = 0.133$). In preliminary versions of Model 1, 15 variables were examined, but in the end, 11 were found to have a statistically significant relationship with violent recidivism and were subsequently included in the analysis. The four eliminated variables were *days at risk, prior convictions, race, education level, and marital status.* As indicated by the Wald statistic, *age at exit* was the most influential (Wald = 2,257). Individuals who exited prison over the age of 25 were approximately 6% less likely to be arrested for a new violent offense within three years post-release, relative to those who exited prison under the age of 25 (odds ratio = .938, $p \leq 0.001$) (see Table 7).

The next most influential variable in model one was *prior violent arrests* (Wald = 1,433). Relative to individuals with less than three prior violent arrests, individuals with greater than four prior violent arrests were around 16% more likely to be rearrested for a violent crime within three years post-prison release (odds ratio = 1.155, $p \leq 0.001$). Following *prior violent arrests*, the next most influential variable in model one was *prior arrests*, this includes all arrests violent and otherwise (Wald = 159). For example, relative to individuals with three or fewer prior arrests, individuals with between four and six prior arrests were around 18% percent more likely to be rearrested for a violent crime within three years of their initial prison release (odds ratio = 1.181, $p \leq 0.001$). *Prior domestic violence arrest* was the fourth most influential variable in this

model (Wald = 121.253). Relative to individuals with no prior domestic violent arrests, individuals with at least one prior domestic violent arrest were around 30% more likely to be rearrested for a violent crime within three years post-prison release (odds ratio = 1.313, $p \leq 0.001$)

Active gang membership was the next most influential variable in this model (Wald = 45.318). Offenders with active gang memberships were approximately 18% more likely to be rearrested for a violent offense within three years of their initial prison release (odds ratio = 1.179, $p \leq 0.001$). The sixth most influential variable in this model was *prior prison* (Wald = 41.811). Offenders with at least one prior prison stay were 23% more likely to be rearrested for a violent offense within three years of their initial prison release, relative to those with no prior prison stays (odds ratio = 1.228, $p \leq 0.001$). Following *prior prison, prior controlled substance arrest* was the seventh most influential variable in this model (Wald = 10.852). Offenders with prior controlled substance arrests were approximately 8% less likely to be rearrested for a violent offense within three years post-initial prison release (odds ratio = 0.921, $p \leq 0.001$)

SUD treatment participation was the eighth most influential variable in this model (Wald = 10.684). Individuals who participated in SUD treatment at Southwestern IL Correctional Center were approximately 16% less likely to be rearrested for a violent crime within three years of their initial prison release (odds ratio = 0.842, $p \leq 0.026$). Individuals who participated in SUD treatment at Sheridan Correctional Center were approximately 13% less likely to be rearrested for a violent crime within three years post-release (odds ratio = 0.871, $p \leq 0.012$).

Released in Cook County (Wald =5 .519), *number of children* (Wald = 5.915), and *drug treatment recommended* (Wald = 4.903) were the three least influential variables in Model One. Offenders released in Cook County were around 10% less likely to be rearrested for a violent

crime within three years post prison release when controlling for all other variables in the model (odds ratio = 0.949, $p \leq 0.019$). Offenders with children were around 15% less likely to be rearrested for a violent crime within three years of their initial prison release (odds ratio = 0.945, $p \leq 0.015$), and offenders who were recommended for drug treatment were around 7% less likely to be rearrested for a violent crime within three years post release (odds ratio = 0.953, $p \leq 0.027$)

Table 7. Logistic Regression Examining SUD Treatment on Violent Recidivism.

	B	Wald Statistic	Exp(B) (Odds Ratio)
Age at Exit [3]	-0.064	2,257	0.938***
Prior Violent Arrests[3]	0.144	1,433	1.155*
Prior Arrests (0-3)		159.272	
4-6	0.166	17.129	1.181***
7+	0.326	82.438	1.386***
Prior Domestic Violence Arrests[3]	0.273	121.253	1.082***
Active Gang Membership[3]	0.165	45.318	1.179***
Prior Prison[3]	0.206	41.788	1.228***
Prior Controlled Substance Arrest[3]	-0.082	10.852	0.921***
SUD Treatment Participation		10.684	
Southwestern IL Participants	-0.172	4.925	0.842**
Sheridan Participants	-0.138	6.319	0.871*
Number of Children [3]	-0.056	5.915	0.945**
Released in Cook County [3]	-0.052	5.519	0.949*
Drug Treatment Recommended[3]	-0.048	4.903	0.953**
Constant	0.254	20.696	1.290***

*$p \leq 0.05$, **$p \leq 0.01$, *** $p \leq 0.001$

[3] Coded as a dichotomous variable.

Analysis Two

The second model examined the relationship between all post-release arrests and substance use disorder treatment participation. Model 2 utilized the reduced population, both individuals who have completed treatment and those who did not but could have been eligible based on their demographic characteristics. Overall, the model was statistically significant (X^2 = 7,784.44, df = 13, $p < 0.001$). Model 2 two explained around 16% of the variation in whether the individual experienced a new post-release arrest (Nagelkerke $R^2 = 0.159$). In preliminary versions of Model 2, 15 variables were examined, but in the end, seven were found to have a statistically significant relationship with general recidivism and were subsequently included in the analysis. The eight eliminated variables are as follows: *number of prior arrests, prior convictions, prior controlled substance arrests, drug treatment recommended, race, number of children, education level, and marital status.* As in Model 1, *age at exit* was the most influential variable in Model 2 (Wald = 4,252.30). Individuals who exited prison over the age of 25 were approximately 6% less likely to be arrested for a new violent offense within three years of their release, relative to those who exited prison under the age of 25 (odds ratio = .946, $p \leq 0.001$) (see Table 8).

The next most influential variable in Model two was *prior prison* stays (Wald = 1,372.015). Offenders with at least one prior prison stay were 48% more likely to be rearrested within three years of their initial prison release, relative to those with no prior prison stays (odds ratio = 1.487, $p \leq 0.001$). Following *prior prison* stays, *release in Cook County* was the next most influential variable in this second logistic regression model. Relative to individuals released to a county other than Cook County, individuals released to Cook County were around 95% more stays (odds ratio = 1.487, $p \leq 0.001$). The fourth most influential variables in Model two

were *prior violent arrests* (Wald= 503.102). Relative to individuals with less than three prior violent arrests, individuals with greater than four prior violent arrests were around 8% more likely to be rearrested within three years post-prison release (odds ratio = 1.954, $p \leq 0.001$). Following this, *prior domestic violence arrest* (Wald = 25.859) was the next most influential variable in model 2. Individuals with at least one prior domestic violent arrest were around 11% more likely to be rearrested within three years post-prison release (odds ratio = 1.109, $p \leq 0.001$) (Table 8).

SUD treatment participation was the least influential variable in this model (Wald = 16.458). Individuals who participated in SUD treatment at Southwestern IL Correctional Center were approximately 21% more likely to be rearrested within three years of their initial prison release (odds ratio = 1.210 $p \leq 0.001$). Individuals who participated in SUD treatment at Sheridan Correctional Center were approximately 13% more likely to be rearrested within three years of their initial prison release (odds ratio = 1.125, $p \leq 0.001$).

Table 8. Logistic Regression Examining SUD Treatment on General Recidivism.

	B	Wald Statistic	Exp(B) (Odds Ratio)
Age at Exit [4]	-0.059	4252.30	0.944***
Prior Prison [4]	0.397	1,599.17	1.487***
Released in Cook County [4]	0.699	1,585.52	1.954***
Prior Violent Arrests[4]	0.075	503.102	1.078***
Days at Risk	0.000	252.446	1.000***
Prior Domestic Violence Arrests[4]	0.103	25.589	1.109***
SUD Treatment Participation		16.458	
Southwestern IL Participants	0.191	10.568	1.210***
Sheridan Participants	0.118	6.972	1.125*
Constant	2.910	2,587.301	18.363***

*$p \leq 0.05$, **$p \leq 0.01$, *** $p \leq 0.001$

[4]Coded as a dichotomous variable.

Analysis Three and Analysis Four

Models 3 and 4 in this study examined the effect of age on treatment efficacy, specifically for new violent post-release arrests among TC participants. The variables included in both models were selected based on their statistically significant relationship with either the violent or general recidivism measure. Model 3 contained a sample of emerging adults from both the statically matched treatment and comparison groups. Model 4 contained a sample of older adults from both the matched treatment and comparison groups (Tables 9 and 10 show the results of these two models). The results of Model 3 showed that treatment participation did not have a statistically significant effect on the likelihood of an emerging adult being rearrested for any new violent crime. On the other hand, the results of Model 4 showed that treatment decreased the likelihood of being rearrested for any new violent crime (odds ratio = 0.791, $p \leq 0.001$) among the older adult population. Once both models were produced, z-scores were calculated and compared to determine if the effect of the SUD treatment variable was different between the two age-specific models, a method previously used by Brame, Paternoster, Mazerolle, & Piquero (1998). Overall, the z-scores calculated for the treatment coefficients in models 3 and 4 were different from each other, and these differences were statistically significant. These differences indicate that treatment participation does affect these two groups differently, with the treatment reducing the likelihood of recidivism for older adults but not emerging adults.

Table 9. Logistic Regression Examining SUD Treatment on Violent Recidivism – Emerging Adult Population

	B	S.E.	Wald	Exp(B)
Treatment [5]	0.075	0.104	0.518	1.078
Released in Cook County [5]	0.235	0.115	4.156	1.265*
Active Gang Membership [5]	0.48	0.126	14.41	1.615***
Prior Violent Arrests [5]	0.077	0.029	6.879	1.08**
Education Level [5]	-0.259	0.105	6.042	0.772*
Race (White)			37.418	
Race (Black)	0.42	0.126	11.103	1.522***
Race (Other)	-0.496	0.183	7.317	0.609**
Prior Convictions (0-1)			20.245	
Prior Convictions (2-3)	0.414	0.117	12.437	1.513***
Prior Convictions (4-5)	0.651	0.176	13.693	1.918***
Prior Convictions (5+)	0.779	0.345	5.095	2.178*
Constant	1.262	0.322	15.395	3.532***

*$p \leq 0.05$, **$p \leq 0.01$, *** $p \leq 0.001$

Table 10. Logistic Regression Examining SUD Treatment on Violent Recidivism – Older Adult Population

	B	S.E.	Wald	Exp(B)
Treatment [5]	-0.235	0.074	10.19	0.791***
Released in Cook County [5]	-0.337	0.08	17.859	0.714***
Active Gang Membership [5]	0.279	0.082	11.499	1.321***
Prior Violent Arrests [5]	0.13	0.011	129.254	1.138***
Education Level [5]	-0.078	0.075	1.092	0.925
Race (White)			2.945	
Race (Black)	0.007	0.092	0.006	1.007
Race (Other)	-0.223	0.148	2.258	0.8
Prior Convictions (0-1)			18.271	
Prior Convictions (2-3)	0.313	0.161	3.767	1.368*
Prior Convictions (4-5)	0.513	0.164	9.81	1.67**
Prior Convictions (5+)	0.545	0.175	9.667	1.725**
Constant	-1.819	0.187	94.29	0.162***

*$p \leq 0.05$, **$p \leq 0.01$, *** $p \leq 0.001$

[5]Coded as a dichotomous variable.

Analysis Five and Six

Models 5 and 6 in this study examined the effect of age on treatment efficacy, specifically for all new post-release arrests among TC participants. The variables included in both models were selected based on their statistically significant relationship with either the violent or general recidivism measure. Model 5 contained a sample of emerging adults from both the statically matched treatment and comparison groups. Model 6 contained a sample of older adults from both the matched treatment and comparison groups (Tables 11 and 12 lists the results of these two models). The results of Model 5 showed that treatment did not have a statistically significant effect on the likelihood of being arrested for any new crime among emerging adults. On the other hand, the results of Model 6 showed that treatment participation did have a statistically significant effect on the likelihood of an older adult being rearrested for any new crime. For older adults, treatment participation increased the likelihood of being rearrested for a new crime by around 12% (odds ratio = 1.117 $p \leq 0.05$). Once the two models were completed, the same method of calculating and comparing z-scores to determine if the effect of SUD treatment was different between the two age populations was employed (Brame, Paternoster, Mazerolle, & Piquero, 1998). Overall, the z-scores calculated for the treatment coefficients in Models 5 and 6 were different from each other, but these differences were not statistically significant. This indicates that treatment participation does not likely affect these two age groups differently when examining general recidivism.

Table 11. Logistic Regression Examining SUD Treatment on General Recidivism – Emerging Adult Population

	B	S.E.	Wald	Exp(B)
Treatment [5]	0.072	0.106	0.457	1.074
Marital Status[5]	-0.146	0.274	0.283	0.864
Race (White)			34.2	
Race (Black)	0.44	0.126	12.194	1.553***
Race (Other)	-0.427	0.185	5.296	0.653*
Active Gang Membership [5]	0.455	0.129	12.538	1.577***
Prior Arrests (0-3)			63.426	
4-6	0.512	0.146	12.239	1.669***
7+	0.8	0.147	29.484	2.226***
Released in Cook County[5]	0.181	0.117	2.379	1.198
Days at Risk	-0.001	0	13.479	0.999***
Prior Prison[5]	0.08	0.145	0.304	1.083
Number of Children[5]	-0.228	0.11	4.321	0.796*
Constant	2.015	0.351	33.036	7.504**

*$p \leq 0.05$, **$p \leq 0.01$, *** $p \leq 0.001$

Table 12. Logistic Regression Examining SUD Treatment on General Recidivism – Older Adult Population

	B	S.E.	Wald	Exp(B)
Treatment [5]	0.11	0.055	4.062	1.117*
Marital Status[5]	-0.308	0.069	19.862	0.735***
Race (White)			39.556	
Race (Black)	0.046	0.069	0.444	1.047
Race (Other)	-0.538	0.102	27.966	0.584***
Active Gang Membership [5]	0.29	0.065	20.027	1.336***
Prior Arrests (0-3)			85.592	
4-6	-0.167	0.105	2.561	0.846
7+	0.246	0.092	7.152	1.279**
Released in Cook County[5]	0.401	0.06	45.46	1.494
Days at Risk	0.00	0.00	9.294	1.00**
Prior Prison[5]	0.261	0.075	12.147	1.298***
Number of Children[5]	0.043	0.066	0.435	1.044
Constant	0.313	0.155	4.058	1.367*

*$p \leq 0.05$, **$p \leq 0.010$, *** $p \leq 0.001$

[5]Coded as a dichotomous variable.

Southwestern Illinois Correctional Center Recidivism Rates

The next step in the analyses was to examine the effects of TCs on recidivism after using the previously discussed propensity scores to match treated participants with comparison subjects who did not participate in SUD treatment. When the Southwestern Illinois Correctional Center treatment and comparison groups are examined trends similar to the logistic regression model's results can be observed. For SUD TC participants at Southwestern Illinois Correctional Center, treatment participation appears to only be effective at reducing violent recidivism, not general recidivism. Figure 4 illustrates the recidivism rates, per 100 individuals, for both the Southwestern Illinois Correctional Center treatment and comparison groups. The three-year violent recidivism rate for Southwestern Illinois TC participants was 16 per 100 individuals, while the three-year violent recidivism rate for the comparison group was 20 per 100 individuals. Based on these recidivism rates there was an approximate 22% reduction in violent recidivism for those who participated in SUD treatment at Southwestern Illinois Correctional Center.

The general recidivism rate for Southwestern Illinois TC participants was 58 per 100 individuals, while the three-year general recidivism rate for the comparison group was 57 per 100 individuals. This indicates that participation in Southwestern Illinois' TC caused individuals' general recidivism rates to increase slightly when compared to the matched comparison group that did not participate in treatment.

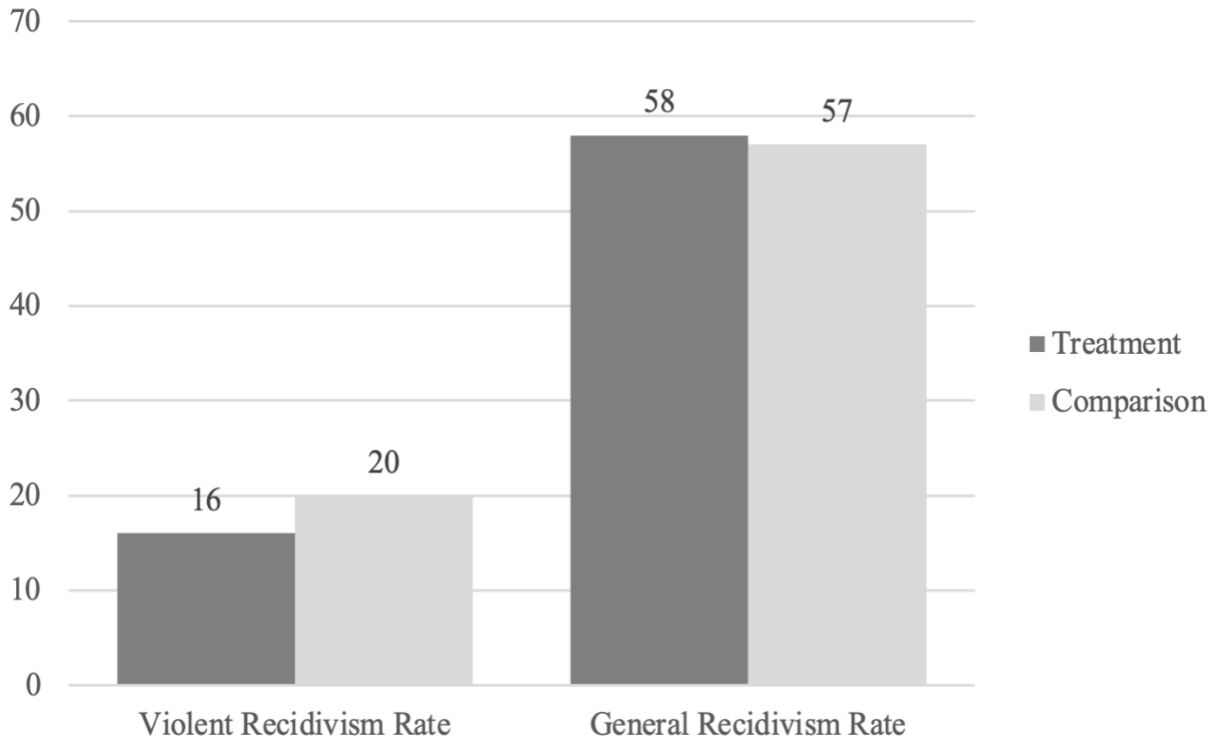
Table 13. Violent Recidivism and SUD Treatment Participation – Southwestern Illinois

		Arrested Within Three Years for a Violent Offense	
SUD Treatment Participant		No	Yes
	No	1131	281
	Yes	1192	220

Table 14. General Recidivism and SUD Treatment Participation – Southwestern Illinois

		Arrested Within Three Years	
SUD Treatment Participant		No	Yes
	No	609	803
	Yes	591	821

Figure 4. Recidivism Rate per 100 Individuals – Southwestern Illinois



Sheridan Correctional Center Recidivism Rates

Similar results can be observed in the matched same of Sheridan Correctional Center TC participants. For SUD TC participants at Sheridan Correctional Center, treatment participation appears to only be effective at reducing violent recidivism, not general recidivism. Figure 5 illustrates the recidivism rates, per 100 individuals, for both the Sheridan Correctional Center

treatment and comparison groups. The three-year violent recidivism rate for Sheridan TC participants was 18 per 100 individuals, while the three-year violent recidivism rate for the comparison group was 21 per 100 individuals. Based on these recidivism rates there was an approximate 15% reduction in violent recidivism for those who participated in SUD treatment at Sheridan Correctional Center.

The general recidivism rate for Sheridan TC participants was 63 per 100 individuals, while the three-year general recidivism rate for the comparison group was 58 per 100 individuals. This indicates that participation in Sheridan's TC caused individuals' general recidivism rates to increase slightly when compared to the matched comparison group that did not participate in treatment.

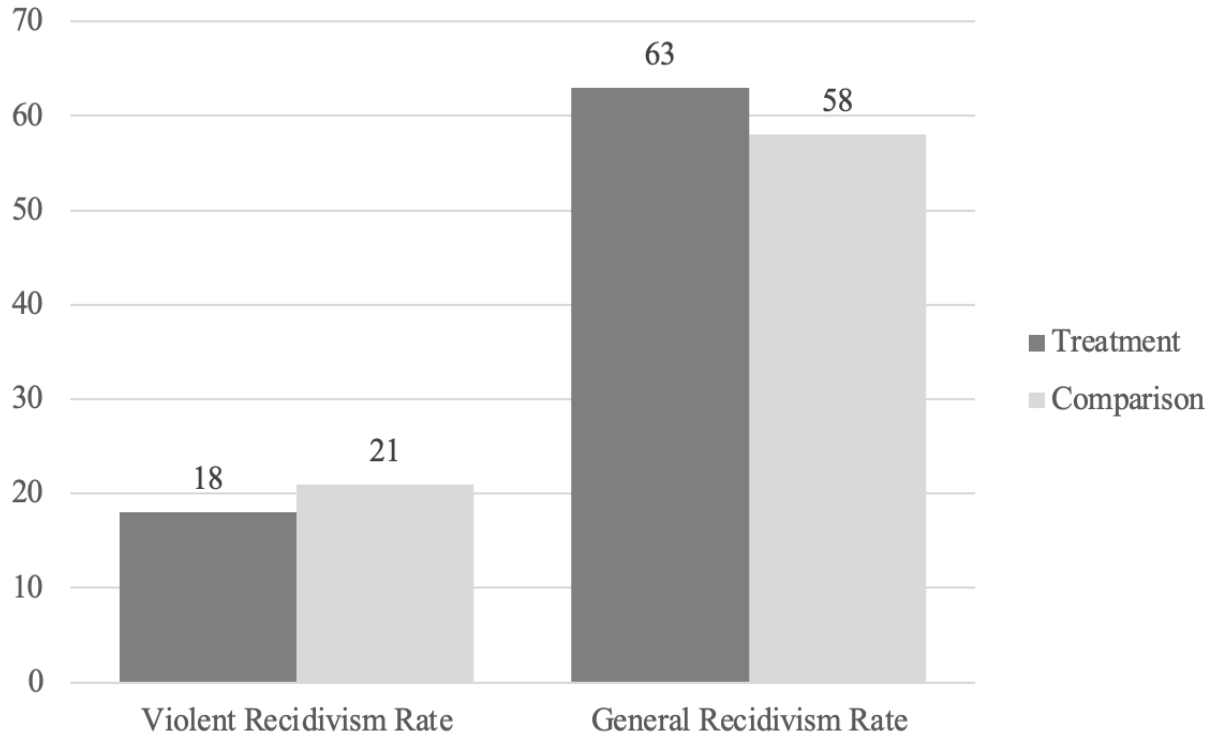
Table 15. Violent Recidivism and SUD Treatment Participation – Sheridan Correctional Center

		Arrested Within Three Years for a Violent Offense	
SUD Treatment Participant		No	Yes
	No	2106	547
	Yes	2173	480

Table 16. General Recidivism and SUD Treatment Participation – Sheridan Correctional Center

		Arrested Within Three Years	
SUD Treatment Participant		No	Yes
	No	1111	1542
	Yes	994	1659

Figure 5. Recidivism Rate per 100 Individuals – Sheridan Correctional Center



DISCUSSION AND CONCLUSION

In the state of Illinois, there are currently two correctional centers fully dedicated to SUD treatment. Both Sheridan Correctional Center and Southwestern Illinois Correctional Center operate SUD treatment programs that utilize the TC treatment modality (Illinois Department of Corrections, 2023). As society continues to increasingly hold many of our systems, especially the U.S. carceral system, accountable and place increased importance on trauma-informed care, it will become more important than ever to properly evaluate these programs. It is not enough to pass legislation that places trauma-informed programs in place, practitioners must also ensure they are being implemented with fidelity and reaching the populations that need them the most. Within the general population, only 8% of individuals who meet the DSM-IV diagnostic criteria for SUD participated in some type of intervention, community or otherwise (Bronson, Stroop, Zimme, & Berzofsky, 2020). Similarly, many individuals in custody who would benefit from SUD interventions never have access to them. In addition, for those who do, there is often a lack of crucial aftercare services (NIDA, 2020, June 1).

Current research suggests a clear need for SUD treatment within carceral settings, and that these services are effective at reducing both short- and long-term recidivism (Bronson, Stroop, Zimme, & Berzofsky, 2020; Andrews & Bonta, 2015; Visher & O'Connell, 2012; Mitchell, Wilson & MacKenzie, 2012; Bryne, 2020; Clack, 2022; Belenko, Hiller, & Hamilton, 2013; Zgoba, Reeves, Tamburello & Debilio, 2020; Maruschak, Bronson & Alper, 2021). As described above, correction-based TCs are a popular and promisingly effective modality for

treating SUD within correctional institutes (NIJ Crime Solutions, 2015; Mitchell et al., 2015; Drake, 2012; McCollister et al., 2003).

Guided by current research covering both recidivism and SUD treatment, the present study attempted to answer two questions. First, did participation in SUD treatment within a corrections-based TC reduce an individual's post-release reoffending, both violent and otherwise? Second, was the efficacy of these interventions greater for emerging adults? In an effort to answer the first question, the effect of SUD treatment participation on both violent rearrests and total rearrests was examined. In the first logistic regression model, it was found that participation in SUD treatment participation did reduce the likelihood of a new arrest for a violent offense post-prison releases, by around 16% for Southwestern Illinois Correctional Center participants and by around 13% for Sheridan Correctional Center participants. In this model, the most influential variable was age at exit. Individuals who were admitted to prison at an older age were less likely to be reasserted during the three-year follow-up period, approximately 6% less likely to be arrested for a violent offense within three years of their initial release when compared to individuals who exited prison as emerging adults. These findings are consistent with current research on the Age-Crime Curve and speak to the impact of age as a criminogenic risk factor (McVie, 2005; Kim & Bushway, 2018, Le Blanc, 2020). An examination of the violent recidivism rates for both correctional centers matched treatment and comparison groups found similar reductions in violent recidivism. There was a 22% difference in the violent recidivism rates for the Southwestern Illinois Correctional Center matched treatment and comparison group (Figure 4) and a 15% difference in the violent recidivism rates for the Sheridan Correctional Center matched treatment and comparison group.

Model 2 examined a similar relationship, but this time expanded the recidivism measure to include all re-arrests (both violent and nonviolent offenses) within three years of their initial release from IDOC. While this is a less nuanced measure of recidivism, one goal of the present study was to apply the Risk-Needs-Responsivity model to its examination of recidivism measured in multiple ways. This second model aimed to examine if participation in SUD treatment programming while incarcerated affected general recidivism outcomes differently than it did for violent recidivism. In this second model, it was found that participation in SUD treatment was associated with an increased general recidivism rate for participants. Those who participated in SUD treatment at Southwestern Illinois Correctional Center were approximately 25% more likely to be rearrested within three years of their initial prison release and those who participated in SUD treatment at Sheridan Correctional Center were approximately 16% more likely to be rearrested within three years of their initial prison release. An examination of the recidivism rates for both correctional centers matched treatment and comparison groups found similar increases in general recidivism rates. There was approximately a 2% difference in the general recidivism rates for the Southwestern Illinois Correctional Center matched treatment and comparison group and an approximate 10% difference in the general recidivism rates for the Sheridan Correctional Center matched treatment and comparison group.

These findings align theoretically with the RNR model. The RNR model of offender treatment states that interventions should be matched the offender's risk and needs level, i.e. the most intensive treatment modalities should be reserved for the highest-risk offenders (Andrews & Bonta, 2015). Residential SUD treatments, such as the TC treatment modality, are highly intensive forms of treatment. Both the RNR model and past recidivism research show that when low-risk offenders participate in interventions intended for high-risk offenders often no reduction

in recidivism is observed, and in some cases, low-risk offenders' recidivism rates have been observed to increase after participation in highly intensive treatment (Bonta, Wallace-Capretta & Rooney, 2000; Lowenkamp & Bechtel, 2007). The results of Model 2 potentially suggest that lower-risk individuals are being served in these prison-based SUD treatment programs and that their participation is elevating their risk for recidivism as a result. This would illustrate the importance of careful assessment and matching of offenders' unique needs to intervention levels.

Models 3 – 6 examined the effect treatment had specifically on younger and older adults. By examining both violent and general reoffending patterns for participants at both correctional centers relative to their respective comparison groups it was revealed that treatment outcomes are in fact different for older adults and emerging adults when focusing on violent recidivism. SUD treatment participation appears to be effective at reducing the likelihood of new post-release violent arrests for older adults but did not affect emerging adults post-release violent re-arrests. Emerging adulthood, the period of time between 17 and 25, offers unique challenges both socially and physiologically. It is possible that these SUD TC programs could be better adapted to fit those unique needs. One way to address this could be to include age-specific programming, such as high school or GED classes, life skills classes relevant to younger adults, and social skills classes to help strengthen interpersonal relationships.

Limitations

It should be noted that the present study evaluated only the TC treatment modality, but there are many other SUD and mental health treatment modalities offered within correctional institutions in the U.S., such as 12-step programs (Belenko, Hiller & Hamilton, 2013; Maruschak & Alper, 2021; Motivans, 2019). Due to this, the present study's results can only speak to the efficacy of corrections–based TC programs within the state of Illinois and are not generalizable

to other types of corrections-based SUD treatment programs. The present study's sample is entirely male as discussed in the preceding manuscript this is because the correctional faculties that house the SUD treatment programs within IDOC are all male. This limited population renders the present study results not generalizable to female samples or to male samples outside of IDOC. In addition, the recidivism data used in the present study were taken from Illinois State Police and Illinois Department of Corrections data. Therefore, there could be more arrests or convictions after an individual initial release from prison that would not be accounted for if committed outside the state of Illinois. In addition to crimes committed in other states, many crimes that are committed go unnoticed by law enforcement and the present study was not able to account for these new offenses.

While many other TC programs have published assessments of program fidelity, the programs operating within the Illinois state prison system do not. The present study is unable to evaluate to what degree of program fidelity the TC programs at Sheridan Correction Center and Southwest Illinois Correctional Center were implemented. In addition, the present study did not have access to information on the specific aftercare participation or dose each participant received. Both recidivism and SUD treatment research emphasize the importance of proper treatment dose and aftercare participation. Without detailed data on these two measures, it is difficult to fully evaluate the effectiveness of these SUD treatment programs.

The current study found different treatment outcomes when compared to the first formal evaluations of both the Southwestern Illinois Correctional Center and the Sheridan Correctional Center TC SUD treatment programs. Both of these evaluations found that participation in SUD treatment reduced total recidivism, by 16% for Sheridan and 15% for Southwestern Illinois, but did not look specifically at rates for violent recidivism. There are a few key differences between

these two initial evaluations and the current study that may have caused the differences in results. First, the initial evaluations measured recidivism as a return to prison, while the current study measured it as new arrests. Second, the initial evaluations looked at the period between July 2006 and June 2010 for Southwestern Correctional Center and between 2005 and June 2010 for Sheridan Correctional Center, the early operating years of both programs. Often in a program's early operating years program fidelity is at its highest. The current study examined a later period of these programs' operations, it is possible that in the years since these first evaluations, the level of program fidelity has dropped, but the current study was unable to measure adherence to program fidelity.

Implications and Directions for Future Research

The current study's results highlight the importance of SUD treatment for incarcerated populations. The RNR model highlights the importance of offender assessment, and correctly matching offenders to intervention levels. The results of this current study support this, as when nonviolent recidivism was included in the outcome measures SUD treatment had little effect. Future SUD research, especially research evaluating corrections-based programming, should examine the assessment process and techniques to ensure the highest level of care is matched with the highest-risk offenders.

In all models, age was a powerfully influential variable. Across the board, individuals who were arrested and admitted to prison at an older age had a lower likelihood of being rearrested during the follow-up period. Age is often referred to as a static risk factor, and, with age offenders often gain community and family ties that can aid in future desistance from crime and drug use. TCs, both community-based and correction-based, place high importance on community accountability. Older offenders often have established careers or job histories,

children, significant others, and community roles. It is clear that a priority be placed on preventing young offenders from making their first contact with the criminal justice system, allowing them time to build social bonds and community engagement which can serve as protective factors from future criminal behavior. In the same vein, active gang membership was an influential variable in all four models. For those active gang members, increases in new arrests, both violent and not, were observed within the three-year follow-up period. These observations are in line with the theory of differential association, which purports that repeated exposure to criminal offending and deviant behaviors will influence an individual's future behaviors. These learned criminal behaviors can be exacerbated by continued exposure to crime and drug offending (Sutherland, 1999).

Finally, the present study was unable to measure treatment dose or participation motivations. Appropriate treatment dose is an essential factor in the success or any intervention or program. Future studies should examine the ways treatment dose affect recidivism rates and future drug use. In addition to treatment dose, future studies should aim to examine individuals' motivations for participating in SUD treatment while incarcerated. Some of the differences in effects between general and violent recidivism may stem from differential motivations by participants. If some offenders agree to participate in treatment due to a desire to abstain from substance use and criminal offending, but others participate as a way to make their stay in prison "easier", the results of the current study would not accurately speak to the effects of these SUD interventions. It would be beneficial to measure participants' motivations and individuals' levels of treatment buy-in to see if these factors further affect treatment outcomes.

APPENDIX A

SUPPLEMENTARY TABLES

Table 1. TCU Drug Screen Questions Adaptation

	Original TCU Question (Taken from the TCU Drug Screen 5)	Matched Questions (Variables) from Data Set
1	Did you use larger amounts of drugs or use them for a longer time than you planned or intended?	Did you use larger amounts of drugs or use them for a longer time than you had planned or intended?
2	Did you try to control or cut down on your drug use but were unable to do it?	Did you try to cut down on your drug use but were unable to do it?
3	Did you spend a lot of time getting drugs, using them or recovering from their use?	Did you spend a lot of time getting drugs, using them, or recovering from their use?
4	Did you have a strong desire or urge to use drugs?	Did your drug use cause physical health or medical problems?[4]
5	Did you get so high or sick from using drugs that it kept you from working, going to school, or caring for children?	Did you get so high or sick from drugs that it kept you from doing work, going to school, or caring for children?
6	Did you continue using drugs even when it led to social or interpersonal problems?	Did your drug use cause problems with family, friends, work, or police?
7	Did you spend less time at work, school, or with friends because of your drug use?	Did you spend less time at work, school, or with friends so that you could use drugs?
8	Did you use drugs that put you or others in physical danger?	Did you get so high or sick from drugs that it caused an accident or put you or others in danger?
9	Did you continue using drugs even when it was causing you physical or psychological problems?	Did your drug use cause emotional or psychological problems?
10a	Did you need to increase the amount of a drug you were taking so that you could get the same effects as before?	Did you increase the amount of a drug you were taking so that you could get the same effects as before?
10b	Did using the same amount of a drug lead to it having less of an effect as it did before?	Did you increase the amount of a drug you were taking so that you could get the same effects as before?
11a	Did you get sick or have withdrawal symptoms when you quit or missed taking a drug?	Did you get sick or have withdrawal when you quit or missed taking a drug?

[4] Data was not available for the original TCU Q4, so the following question: “Did your drug use cause physical health or medical problems” was added to account for the second part of “Did you continue using drugs even when it was causing you physical harm” of original TCU Q 9.

Table 2. TCU Scoring Guideline

TCU scores will be interpreted as follows:

Mild disorder: Score of 2-3 points (presence of 2-3 symptoms)
Moderate disorder: Score of 4-5 points (presence of 4-5 symptoms)
Severe disorder: Score of 6 or more points (presence of 6 or more symptoms)

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VITA

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