2017

Comparing the Risk Factors of Recidivism for Offenders with and Without Mental Illness

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COMPARING THE RISK FACTORS OF RECIDIVISM FOR OFFENDERS WITH AND WITHOUT MENTAL ILLNESS

A THESIS SUBMITTED TO

THE FACULTY OF THE GRADUATE SCHOOL

IN CANDIDACY FOR THE DEGREE OF

MASTER OF ARTS

PROGRAM IN CRIMINAL JUSTICE AND CRIMINOLOGY

BY

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CHICAGO, IL

DECEMBER 2017

ACKNOWLEDGMENTS

I would like to thank all of the people who have helped to make this thesis possible, starting with my committee chair and mentor, Dr. Loretta Stalans. I am forever grateful for all of the encouragement and guidance you have provided me with over the last two years. I cannot thank you enough for always making time to meet with me, answer my questions, read my drafts, and provide me with thoughtful and insightful feedback. I would also like to thank Dr. David Olson and Dr. Don Stemen for serving as committee members and providing me with insightful feedback on the final drafts of my thesis.

To my family, thank you for all of your love and support over the last two years. Especially my incredibly supportive parents, Richard and Virginia Mahoney. I cannot thank you enough for always believing in me and encouraging me to do my best. Finally, I would like to thank my best friend, my love, David Drapal. I do not know what I would have done without your unwavering love and support throughout this process. You have been the most understanding, patient, and supportive partner and for that I am forever grateful.

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ABSTRACT

This study examined which risk factors were predictive of recidivism among inmates released from Illinois Department of Corrections (IDOC) who had no mental illness, a non-substance abusing mental illness (non-SUD MI), a substance use disorder (SUD), or a co-occurring mental illness and substance use disorder (COD). The predictors of being returned to prison or being rearrested for a violent, property, or drug crime were compared across these four groups. A secondary data analysis was conducted on data obtained by Olson, Stalans, and Escobar (2016) for a study examining the predictors of recidivism for inmates released from IDOC in 2007. Logistic and negative binomial regressions examined the relationship between predictors of interest and each outcome. For each outcome, comparisons were made across the mental health groups by calculating *z* scores for each significant predictor. Across the four recidivism measures, the four mental health groups shared few significant predictors. Implications are discussed.

INTRODUCTION

In 2015, the United States federal and state prisons had an estimated 1,526,800 prisoners (Bureau of Justice Statistics, 2016). Although the size of the prison population varies each year, prior research indicates that within the United States prison population between 10% to 20% of inmates have an Axis I major mental illness (Baillargeon et al., 2010, p. 367). The percentage of people with a major mental illness is much higher than in the general population. In 2015, there were an estimated 4% of people with a serious mental illness in the United States (Center for Behavioral Health Statistics and Quality, 2016). Compared to the general population, inmates with a major mental illness are overrepresented in the prison system. Major mental illnesses include bipolar disorder, major depressive disorder, and schizophrenia. A mental illness "is a syndrome characterized by clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning" (American Psychiatric Association [APA], 2013).

The prevalence of substance use disorder, a specific mental illness, is also elevated within the criminal justice system. There is a higher rate of substance use disorder among persons involved with the criminal justice system compared to the general population. "The lifetime prevalence of DSM-IV substance use disorders among prisoners is over 70%" (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016, p. 5). This is much higher than in

the general population, where an estimated 7.8% of people in the United States had a substance use disorder within the last year (Center for Behavioral Health Statistics and Quality, 2016). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), substance use disorder is diagnosed "based on a pathological pattern of behaviors related to use of the substance" (APA, 2013). There are four categories of criteria used to diagnose an individual with a substance use disorder. The first category of criteria, "impaired control," is when an individual lacks control over their substance use, uses a substance in greater quantity, and uses for a longer span of time than intended (APA, 2013). A person with "impaired control" may unsuccessfully attempt to decrease their use, spend a great deal of time obtaining, using, and recovering from the use of a substance. A person may even experience cravings for the substance they use when in an environment they have spent time in obtaining or using said substance in the past. The second category of criteria, "social impairment," occurs when a person fails to fulfill their daily obligations due to their substance use, continues to use substances after experiencing negative consequences from use, and withdraws from typical activities in favor of using substances (APA, 2013). The third category of criteria is "risky use" which is when an individual uses a substance that is physically harmful or when an individual continues to use a substance even if they experience physical or psychological problems due to use (APA, 2013). The fourth group of criteria, "pharmacological criteria," is met when an individual has developed a tolerance for the substance they are using and experiences withdrawal symptoms after they stop using the substance (APA, 2013).

According to SAMHSA (2016), 60% to 87% of individuals with mental illness in the criminal justice system also have a substance use disorder (p. 5-6). When an individual has at

least one mental illness and a substance use disorder, they are labeled as having co-occurring disorders (APA, 2013). Offenders with co-occurring disorders may consistently be in and out of prison if they do not receive the adequate support and treatment they need. Several studies have found that individuals with a major mental illness with a co-occurring substance abuse disorder have higher rates of recidivism compared to individuals with only a major non-substance abusing disorder or those without a mental illness (Baillargeon et al., 2010; Balyakina et al., 2014; Elbogen & Johnson, 2009; Rezansoff, Moniruzzaman, Gress, & Somers, 2013; Swartz & Lurigio, 2007). Though research has consistently found that a co-occurring disorder increases the rate of recidivism, several questions need additional empirical research. This thesis examines the similarities and differences in criminal history and social background characteristics of four groups of inmates released from Illinois prisons: a) Non-mentally disordered; b) Only a non-substance abusing mental illness; c) Only a substance-abusing disorder; and d) Co-occurring disorder of mental illness and substance abuse. The thesis extends prior research in the risk assessment field through examining the extent to which these four groups of released inmates have similar or different characteristics (i.e., risk factors) that predict the likelihood of recidivism.

CHAPTER ONE

LITERATURE REVIEW

There are two related, but separate fields on risk assessment, studies focusing exclusively on persons with mental illnesses (Alia-Klein, O'Rourke, Goldstein, & Malaspina, 2007; Elbogen & Johnson, 2009; Large & Nielssen, 2011; Monahan et al., 2000; Skeem, Kennealy, Monahan, Peterson, & Appelbaum, 2016; Steadman et al., 1998; Swanson et al., 1997) and studies focusing exclusively on persons who have been convicted of at least one criminal offense (Bonta, Blais, & Wilson, 2014; Bonta, Law, & Hanson, 1998; Becker, Andel, Boaz, & Constantine, 2011; Ferguson, Ogloff, & Thomson, 2009; Junginger, Claypoole, Laygo, & Crisanti, 2006; Kingston et al., 2016; Lovell, Gagliardi, & Peterson, 2002; Peterson, Skeem, Hart, Vidal, & Keith, 2010; Peterson, Skeem, Kennealy, Bray, & Zvonkovic, 2014; Reich, Picard-Fritsche, Lebron, & Hahn, 2015; Skeem, Winter, Kennealy, Louden, & Tatar, 2014). Due to the high rate of arrests and convictions of persons with mental illness, the studies focusing on offenders contain both those with and without mental illness. The focus of this thesis revolves around the question of whether released inmates without mental illness, with only a non-substance using mental illness (non-SUD MI), with only a substance use disorder (SUD), or with a co-occurring disorder (COD) have different or similar risk factors for violent recidivism, and specific forms of non-violent recidivism. The literature review first begins with an overview of the risk assessment field and the two theoretical perspectives that dominate these two fields: risk-need-responsivity (RNR) model (Andrews & Bonta, 2010) and the psychiatric model (Large & Nielssen, 2011; Monahan

et al., 2001; Torrey, 2011). A third model in the risk assessment field, the moderated mediation model, will also be reviewed (Skeem, Manchak, & Peterson, 2011). The literature review will then review studies in the risk assessment field using populations of mentally ill persons that predict behaviors that would be criminal acts if caught and convicted (e.g., illicit drug addiction, violence); these studies often rely on self-report surveys or victimization surveys. Then, empirical studies in the risk assessment field on released probation or prison samples will be reviewed. Finally, studies that have examined differences in risk factors for subgroups of mentally ill offenders will be reviewed. Within each of these sections, similarities of predictors for all types of arrests for new crimes (general recidivism), and unique predictors for nonviolent or violent recidivism will be discussed.

Overview of the Risk Assessment Field

According to Kraemer et al. (1997), risk assessment is "the process of using risk factors to estimate the likelihood (i.e., probability) of an outcome occurring in a population" (p. 340). In the criminal justice system, risk assessment can be used to determine bail eligibility, guide sentencing decisions, and assist in determining parole eligibility (Skeem & Monahan, 2011). Clinicians may use risk assessments to assist in the evaluation of mentally ill patients to determine the patients' risk for violent behavior. There are two general approaches to assessing risk: clinical assessment and actuarial assessment, with variations of risk assessment existing within each approach. According to Skeem and Monahan (2011), risk assessments "exist on a continuum of rule-based structure" ranging from unstructured clinical assessment to structured actuarial assessment (p. 39). Five approaches are identified within this continuum: unstructured clinical assessment, modified clinical assessment, structured professional judgment, modified

actuarial risk assessment, and unmodified actuarial risk assessment. These approaches have developed over time in what Andrews and Bonta (2010) describe as the four generations of risk assessment.

The first-generation of risk assessment relied on "professional judgment" to assess an individual's risk for future criminal behavior (Andrews & Bonta, 2010, p. 311). This assessment approach relied strictly on a clinician's judgment, as there were no rules to shape the assessment. There are two types of professional judgment: "unmodified clinical risk assessment" and "structured clinical risk assessment" (Monahan, 2012; Skeem & Monahan, 2011). In unmodified clinical risk assessment, the clinician decided what factors were important for assessing risk. To gather information considered relevant for assessing risk, a clinician would conduct an unstructured interview, administer psychological tests, or review the individual's case file. After gathering relevant information, the clinician would determine the patient's level of risk. In the second type of professional judgment, modified clinical risk assessments, clinicians would use a list of empirically validated and theoretically relevant risk factors to guide the risk assessment process. The clinician would still make the final decision about an individual's level of risk. "The key feature of the clinical approach is that the reasons for the decision are subjective, sometimes intuitive, and guided by 'gut feeling'—they are not empirically validated" (Andrews & Bonta, 2010, p. 312). The factors clinicians focused on were unobservable and could potentially be unrelated to the individual's criminal behavior. (Andrews & Bonta, 2010). This hindered the predictive ability of the clinician and is a major critique of this approach. Prior research found clinicians were unable to consistently predict a patient's risk of future violence

(Steadman & Cocozza, 1974). The next generation of risk assessments address the limitations of the first-generation.

The second-generation of risk assessment addresses the limitations of the first-generation of risk assessment with the use of actuarial risk assessments. "Unmodified actuarial risk assessments" identify which risk factors are empirically relevant, how they should be measured and combined, and generates a final risk estimation (Monahan, 1981; Monahan, 2012; Skeem & Monahan, 2011). Actuarial assessments consist of mostly static risk factors which are factors that cannot be changed, such as criminal, victimization, and mental health history. Assessments in this generation are typically measured (i.e., scored) by assigning a 0 or 1 to each variable or by assigning variables different weights (Bonta, 1995). The final risk estimation is based solely on the outcome of the actuarial assessment and is not based on clinical prediction. Second-generation tools include the Violence Risk Assessment Guide (VRAG; Harris, Rice, & Quinsey, 1993), Salient Factor Score (SFS; Hoffman, 1994), and the Offender Group Reconviction Score (OGRS; Copas & Marshall, 1998). The second-generation risk assessments are considered more powerful than clinical approaches to risk assessment (Andrews & Bonta, 2010). However, there are critiques of actuarial methods due to the lack of theoretical consideration and dependence on static risk factors (Bonta, 2002). Relying on static risk factors limits the ability to measure how an individual's risk can change over time and fails to identify what should be targeted in treatment or intervention (Andrews, Bonta, & Hoge, 1990; Andrews & Bonta, 2010). For this reason, Andrews and Bonta (2010) assert that the "second-generation risk scales are useful for release decisions and security and supervision classification" (p. 313). Critiques of the second-generation of risk assessment are addressed in the third-generation of risk assessment.

The third-generation of risk assessment is a blend of the clinical and actuarial approach and incorporates theoretically informed dynamic risk factors. Dynamic risk factors are ones that can be changed, such as current substance abuse or mental health issues. Being able to identify an individual's specific dynamic risk factors helps determine what type of intervention or treatment is necessary to reduce their overall risk. One approach in this generation, "modified actuarial risk assessments" structure three components, the "identification, measurement, and combination of risk factors" (Monahan, 2012; Skeem & Monahan, 2011). Risk factors include static and dynamic risk factors which are measured with actuarial risk assessments. Risk factors are typically combined (i.e., scored) using logistic regression or classification tree analysis. In logistic regression, the same questions are used to assess every person, each question is weighted, and the scores are added together to produce a risk estimate (Monahan et al., 2000; Stalans & Seng, 2007). The Level of Supervision Inventory—Revised (LSI-R; Andrews & Bonta, 1995) is a "modified actuarial risk assessment" and utilizes logistic regression to combine risk factors. Classification tree analysis does not use the same questions to assess everyone, but identifies which risk factors are most relevant and predictive for each individual. Factors are combined either nonlinearly or linearly depending on which combination provides the most accurate risk prediction (Stalans & Seng, 2007). Two thresholds are established to identify individuals who are at a low-risk for criminal behavior or a high-risk for criminal behavior. Individuals who fall between the two thresholds and are considered at "average-risk" (Monahan et al., 2000). The Classification of Violence Risk (COVR; Monahan et al., 2006) is a "modified actuarial risk assessment" that utilizes the classification tree method. Following the actuarial assessment, the clinician can review the level of risk an individual is assigned. "There is always a

possibility that a person possesses a rare risk factor that is not included on the risk assessment" therefore, the clinician may find it appropriate to assign an individual to a higher or lower level of risk (Monahan, 2012, p. 173-174). Another approach in the third-generation of risk assessment, "structured professional judgment" (SPJ) structures the identification and measurement of risk factors (Monahan, 2012; Skeem & Monahan, 2011, p. 39). The Historical, Clinical, and Risk Management Violence Risk Assessment Scheme (HCR-20; Webster, Douglas, Eaves, & Hart, 1997) is an SPJ assessment. The questions on this assessment are scored 0 (*risk factor not present)*, 1 (*risk factor potentially present*), or 2 (*risk factor is present*; Douglas & Webster, 1999). However, there are no directions for how these risk factors should be combined to calculate a final risk estimate. The clinician makes the final decision about an individual's risk level. The next generation of risk assessment further adds to the utility of risk assessment by incorporating risk reduction.

The fourth-generation of risk assessment "emphasize the link between assessment and case management" (Andrews & Bonta, 2010, p. 318). Risk assessment is used to identify an individual's criminogenic needs, which can then be targeted through treatment or interventions with the goal of reducing recidivism. These assessments are "designed to be integrated into (a) the process of risk management, (b) the selection of intervention modes and targets for treatment, and (c) the assessment of rehabilitation progress" (Campbell, French, & Gendreau, 2009, p. 569). Risk assessments can be administered to a person multiple times throughout their involvement in the criminal justice system. This allows for changes in the offender's criminogenic needs to be tracked overtime (Campbell et al., 2009). Measures deriving from the fourth-generation of risk assessment include, the Correctional Offender Management Profiling for Alternative Sanctions

(COMPAS; Brennan & Oliver, 2000), the Offender Intake Assessment (OIA) of Correctional Canada (Motiuk, 1997) and the Level of Service/Case Management Inventory (LS/CMI; Andrews, Bonta, & Wormith, 2000).

Three Theoretical Perspectives: RNR, Psychiatric, and Moderated Mediation Model

There are two main theoretical perspectives guiding the risk assessment field for offenders with mental illness: the psychiatric model and the RNR model. The RNR model and psychiatric model differ in goals, definitions of risk, predictors, outcomes, and definitions of mental health (McCormick, Peterson-Bandali, & Skilling, 2015). The main goal of the psychiatric model is to treat and manage mental health and focuses on the individual. The RNR model is focused on the criminal justice system with the main goal of reducing recidivism. This is achieved by predicting which offenders are most likely to recidivate and providing these offenders with treatment (McCormick et al., 2015). The psychiatric model assumes clinical variables are predictive of criminal behavior, but the RNR model finds these to be only minor risk factors. Risk factors in the psychiatric model can either directly or indirectly relate to criminal behavior and can be identified through simple measures of association (McCormick et al., 2015). In the RNR model, risk factors must have a "strong, direct statistical relationships" and factors must have a direct effect on an offender's chance of reoffending in the future (McCormick et al., 2015, p. 215). In the psychiatric model, mental illness is operationalized using specific formal diagnostic labels, such as major depressive disorder, bipolar disorder, schizophrenia, and substance use disorder. In the RNR model, mental illness is measured as certain features, such as impulsivity, depression, and personal emotional distress (McCormick et al., 2015). The psychiatric model is interested in a diverse set of outcomes, such as history of

aggression, rates of violence, rates of aggressive behavior, self-reported delinquency, first time involvement with the criminal justice system, and days in detention (McCormick et al., 2015). The outcome of interest in the RNR model is recidivism and is typically measured using official reports of criminal justice involvement. While there are many differences between the RNR model and psychiatric model, there are some shared views as well.

Both the RNR model and psychiatric model hold the view that screening and assessment for mental illness should be increased, that treatment should be provided to offenders, and that low-risk offenders should be processed minimally within the criminal justice system (McCormick et al., 2015). Both models identify criminal history, family variables, and specific features of mental illness as risk factors for recidivism. These differences and similarities are evident when examining risk assessment studies from each model.

Risk-Need-Responsivity Model

To determine an offender's potential risk of recidivism, Andrews and Bonta (2010) recommend that correctional facilities follow the principles set forth by the RNR model, although some empirical research suggests that some prisons have limited resources to offer treatment (Sneed, 2015). According to Andrews, Bonta, and Wormith (2006), the RNR model addresses risk and need in correctional settings by distinguishing which offenders should receive treatment (risk principle), establishing which criminogenic needs should be targeted (need principle), and determining what type of treatment is necessary and appropriate (responsivity principle) to reduce criminogenic needs. The risk principle states that an offender's risk level can be used to predict future criminal behavior. Level of risk is determined by assessing an offender's risk factors, which are "personal attributes and circumstances that are assessable prior

to service and are predictive of future criminal behavior" (Andrews et al., 1990, p. 24). The risk principle also involves matching the offender's level of risk with the proper intensity of intervention (McCormick et al., 2015). The strongest risk factors should be targeted in the selected intervention or treatment.

As mentioned in the need principle, criminogenic needs are the static and dynamic factors that are empirically related to and contribute to offending behavior (McCormick et al., 2015, p. 214). If an individual's specific criminogenic needs can be identified, treatment can target their specific needs and reduce their likelihood of future criminal involvement (Andrews & Bonta, 2010). The need principle states that the dynamic risk factors should be targeted because these are the only factors that are changeable. Therefore, the goal of treatment should be to target an individual's specific dynamic risk factors. The third principle of the RNR model, responsivity, states that treatment should be matched to a person's abilities and learning styles (Andrews & Bonta, 2010). Offenders' learning styles should dictate which type of treatment or intervention they receive. Once a treatment is selected, it can be modified to address the specific needs of an individual. The overall goal of the RNR model is to predict who is likely to recidivate and provide risk management or treatment to reduce the likelihood of reoffending (McCormick et al., 2015).

Personality and social learning theories of psychology provide the theoretical framework for the identification of risk factors in the RNR model (Andrews et al., 2006). Social learning theory asserts that criminal behavior is learned when criminal activities are modeled and reinforced (Bonta et al., 1998; Skeem et al., 2011). This theoretical approach "focuses on the social and personal factors that reward and fail to punish ongoing criminal activity" (Bonta et al.,

1998, p. 138). Social factors can include the environment an individual lives in. Criminal activity would be more likely to be rewarded in an environment where crime is tolerated or supported. Personal factors that are conducive to crime include certain personality styles, attitudes or belief that support criminal activity, and a history of personal gains from criminal activity (Bonta et al., 1998). This theoretical approach was used by Andrews and Bonta (2010), who developed a general personality and cognitive social learning (GPCSL) model of criminal conduct. The GPCSL model states that the factors that cause crime derive from the individual and their social learning environment (Bonta et al., 2014). The eight major risk/need factors are: history of antisocial behavior, antisocial personality pattern, antisocial cognition, antisocial associates, family and/or marital, school and/or work, leisure and/or recreation, and substance abuse.

Psychiatric Model

According to the psychiatric model, in offender populations mental illness is associated with violence and criminal behavior. This has been supported by studies finding mentally ill offenders to be more likely to recidivate and experience more incarcerations over time than non-mentally ill offenders. Cloyes, Wong, Latimer, and Abarca (2010) found offenders with serious mental illness to have "significantly higher rates of recidivism, returning to prison nearly 1 year sooner than non-SMI offenders" (p. 183). Mentally ill offenders are also at an increased risk of experiencing multiple incarcerations. In a six-year retrospective study, inmates with a major mental illness were more likely to have had multiple incarcerations compared to inmates without a major mental illness (Baillargeon, Binswanger, Penn, Williams, & Murray, 2009, p. 105). The psychiatric model also asserts that specific mental health diagnoses are associated with criminal behavior.

The psychiatric model assumes clinical variables, such as mental health diagnosis and self-reported symptomology, to be predictive of patients and offender's criminal behavior. Specific mental illness diagnoses have been associated with greater risk of violence and recidivism in both patient and offender populations. The MacArthur Violence Risk Assessment study found a statistically significant difference between the 1-year prevalence rate of violence for patients with schizophrenia (14.8%), compared to patients with bipolar disorder (22%), and patients with depression (28.5%; Monahan et al., 2001). Patients released from a psychiatric facility with a diagnosis of schizophrenia did not have a greater propensity for violence than patients with bipolar disorder or depression. Offenders diagnosed with an antisocial personality disorder or an unspecified personality disorder have been found to be at an increased likelihood of both general and violent recidivism (Bonta et al., 1998; Bonta et al., 2014). Among offenders with mental illness, antisocial personality disorder was found to be "a significantly better predictor than any other clinical disorder, such as schizophrenia, manic depression, and paranoia" (Bonta et al., 1998, p. 128). It is possible that it is not the specific diagnosis that causes criminal behavior in patient or offender populations, but specific features of mental illness that contribute to criminal behavior.

In the psychiatric model, symptoms of major mental illness have been attributed to the increased risk of violence and criminal behavior in patient populations. Symptoms such as psychosis, delusions, hallucinations, violent thoughts, and anger have been attributed to an increased risk in criminal behavior among the mentally ill patients (Monahan et al., 2001). In the MacArthur Violence Risk Assessment Study, Monahan et al. (2001) found patients experiencing hallucinations and delusions to be at an increased risk of violence at the 1-year follow-up period,

but not at the 20-week follow-up. Patients experiencing command hallucinations were at an increased risk for violence during the 1-year follow-up, while there was a trend at the 20-week follow-up. Patients who experienced command hallucinations where voices ordered them to commit a violent act towards another person, were significantly more likely to be violent in the 20-week follow-up and 1-year follow-up (Monahan et al., 2001). In a meta-analysis of 204 studies, Douglas, Guy, and Hart (2009) found that among individuals in civil psychiatric, community, and correctional samples, psychosis was "associated with a 49%-68% increased likelihood of violence" (p. 692). Individuals who experienced psychosis were significantly more likely to be violent than those without psychosis.

The impact specific traits of mental illness have on future criminal behavior and violence has been further examined in studies looking at the effects of treatment. According to the psychiatric model, untreated mental illness directly causes criminal behavior; therefore, treatment will help to reduce violence (McCormick et al., 2015; Kingston et al., 2016; Torrey, 2011). In a meta-analysis, Large and Nielssen (2011) report that patients experiencing psychosis for the first time typically commit a violent act before receiving treatment, with less serious violence occurring more frequently (1 in 3 patients) than more serious violence (1 in 6 patients) and severe violence (1 in 100 patients). Less serious violence consisted of acts that did not cause physical harm while more serious violence consisted of acts that caused injury, involved the use of a weapon, or involved sexual assault. Acts involving serious injury were considered severe violent acts. The length of time between the first episode of psychosis and treatment was associated with more serious violence (Large & Nielssen, 2011). Even when persons with mental illness do receive treatment they may not adhere to their treatment plan or medications. Alia-

Klein et al. (2007) examined medication compliance among 60 patients at a forensic psychiatric unit in New York. The authors found "a significant main effect of medication adherence on violence severity" (p. 91). Offenders who were noncompliant with medication on a regular basis "engaged in significantly more severe violence" than offenders who were compliant with their medication (p. 91). Access and adherence to treatment is essential to reducing future violence. The findings and belief that untreated mental illness is related to criminal behavior has led to the belief that psychiatric treatment alone can reduce criminal behavior in this population.

However, many studies have found that after accounting for other factors (i.e., eight-major risk/need factors), offenders with mental illness are not truly at an increased risk of recidivism (Bonta et al., 1998; Bonta et al., 2014; Messina, Burdon, Hagopian, & Prendergast, 2004; Phillips et al., 2005; Reich et al., 2015; Wilson, Draine, Hadley, Metraux, & Evans, 2011). Numerous studies have found that the psychiatric model's clinical variables do not consistently predict recidivism among offenders with mental illness (Bonta et al., 1998; Bonta et al., 2014; Lam, 2014; Kingston et al., 2016; Skeem et al., 2014). In a meta-analysis conducted by Bonta et al. (1998), the similarities and differences in the predictors of recidivism for offenders with mental illness were compared to the predictors for offenders without mental illness. Of the four domains of predictors included in the analysis (personal demographics, criminal history, deviant lifestyle, clinical), the clinical domain produced the smallest effect size for both general (*Zr* = -.02) and violent recidivism (*Zr* = -.03). In an updated meta-analysis, Bonta et al. (2014) found psychosis (including schizophrenia and hallucinations), mood disorder (depression or anxiety), prior psychiatric hospital admissions, and psychiatric treatment history to be nonsignificant

predictors of general and violent recidivism. The lack of significant clinical variables indicates that other predictors may better explain the relationship between mental illness and crime.

Moderated Mediation Model of Mental Illness Effects

Assumptions from the psychiatric model and the RNR model are both used by Skeem et al. (2011) in their theory that the relationship between mental illness and criminal behavior can be explained by "moderated mediation" (p. 118). Whether mental illness and criminal behavior are directly or indirectly related is determined by a moderator variable. Skeem et al. (2011) use "age of onset for criminal behavior (i.e., childhood/adolescence versus adulthood)" as an example of a potential moderator variable (p. 119). Offenders who first engage in criminal behavior during adulthood represent a "small subgroup of offenders with mental illness (perhaps one in ten)" (Skeem et al., 2011, p. 118). For these offenders, the relationship between mental illness and criminal behavior is direct. For a majority of offenders, the relationship between mental illness and crime is mediated by a third variable "that establishes general risk factors for crime" (Skeem et al., 2011, p. 118). This could explain the relationship between mental illness and crime for offenders who engage in crime during childhood or adolescence early. These offenders are exposed to more general risk factors for crime over a longer period of time (Silver, 2006). The mediated relationship between mental illness and criminal behavior is supported in the risk assessment literature.

The findings from several studies provide evidence that mental illness and criminal behavior are direct for a small subgroup of offenders. Peterson et al. (2014) conducted intensive interviews with 143 mentally ill offenders participating in county mental health court to determine how frequently and consistently symptoms of a psychotic disorder, bipolar disorder, or

depression directly preceded criminal behavior. Symptoms of mental illness were "mostly or completely related directly to symptoms" in one-fifth of the crimes committed (Peterson et al., 2014, p. 444). More specifically, of the 429 crimes coded, there was a direct relation to symptoms of psychosis in 4% of cases, symptoms of bipolar in 10% of cases, and symptoms of depression in 3% of cases. Junginger et al. (2006) reported similar findings in their study of 113 offenders with mental illness and co-occurring disorders participating in a jail diversion program. Using participants' explanation of the crime and police reports, researchers determined if hallucinations or delusions directly caused the current criminal offense. Only 4% of the current criminal offenses were deemed a direct effect of mental illness. Peterson et al. (2010) found hallucinations and delusions directly caused criminal behavior in 5% (n = 6) of parolees. Psychiatric populations have also seen similar results, psychosis preceded 11.5% of violent incidents among high-risk former psychiatric patients involved in the MacArthur Violence Risk Assessment Study (Skeem et al., 2016). These studies support the notion that mental illness causes crime for only a small subgroup of offenders.

For majority of offenders, a third variable likely mediates the relationship between mental illness and criminal behavior. Among a sample of 368 parolees, Matejkowski and Ostermann (2015) found serious mental illness did not have a direct effect on recidivism but "was indirectly related to recidivism at 2 years postrelease through its relationship with risk level" (p. 82). Serious mental illness was associated with an increase of four points in risk level as measured by the LSI-R and having an increased level of risk was significantly associated with criminal recidivism. This increase in level of risk could be due to the LSI-R measuring variables that are related to mental illness. However, the increased level of risk could also be due to

mentally ill offenders possessing more general risk factors than non-mentally ill offenders. If this is the case, other general risk factors would mediate the relationship between mental illness and criminal recidivism.

The presence of substance use has also been identified as a mediating variable. Studies have found that the relationship between mental illness and recidivism becomes weak or insignificant when substance use is included in the analysis (Baillargeon et al., 2010; Balyakina et al., 2014; Elbogen & Johnson, 2009; Rezansoff et al., 2013; Swartz & Lurigio, 2007). In a longitudinal study, Elbogen and Johnson (2009) found mental illness was not a direct cause of violence among a sample of noninstitutionalized individuals. Specific types of mental illness (schizophrenia, bipolar disorder, and major depression) were also found to not be predictive of violent behavior in this sample. However, individuals with severe mental illness with a co-occurring substance use disorder had significantly higher rates of violence than individuals with mental illness only or substance abuse only. Research has consistently found that individuals (in offender and civilian populations) with a mental illness and co-occurring substance use disorder are at a greater risk for violence and criminal recidivism compared to offenders with only a mental illness (Baillargeon et al., 2010; Balyakina et al., 2014; Elbogen & Johnson, 2009; Ferguson et al., 2009; Kingston et al, 2016; Monahan et al., 2001; Rezansoff et al., 2013; Steadman et al., 1998; Swanson et al., 2006; Swartz & Lurigio, 2007). Using a noninstitutionalized nationally representative sample, Swartz and Lurigio (2007) examined the relationship between mental illness, substance use, and arrest. Individuals who had a serious mental illness with co-occurring substance use were more likely to be arrested for a drug, property, or other nonviolent offense compared to individuals who did not use substances. The

direct effect of mental illness on criminal behavior was no longer significant after accounting for substance use. Substance use was mediating the relationship between serious mental illness and arrest for most types of crimes.

Risk Assessment of Persons with Mental Illness

It has been theorized that offenders with mental illness possess the same risk factors as offenders with no mental illness and that mentally ill offenders just possess more of these risk factors. The risk factors that predict recidivism in offenders with no mental illness have also been studied in offenders with mental illness. Prior research has consistently found that the central eight risk/need factors from the RNR model are predictive of recidivism among mentally disordered offenders (Bonta et al., 1998; Bonta et al., 2014; Kingston et al., 2016). The RNR model asserts that the strongest predictors of recidivism are antisocial personality pattern, antisocial attitudes, a history of antisocial behavior, and antisocial associates (Andrews & Bonta, 2010). These four domains are generally referred to as the "Big Four" and there are specific risk/need factors within each domain. There are four additional domains which are considered moderate predictors: substance abuse, family/marital, leisure/recreation, and school/work. Together, the "Big Four" and the four moderate predictors are known as the central eight risk/need factors (Andrews & Bonta, 2010). Structured risk assessments have been found to outperform clinical assessment in risk prediction of offenders with mental illness (Bonta et al., 1998). Risk assessment tools containing the central eight risk/need factors, including the Level of Service Inventory—Revised: Screening Version (LSI-R:SV), Level of Service/Risk–Need–Responsivity Instrument (LS/RNR), and the Level of Service/Case Management Inventory (LS/CMI), have been validated for use with mentally ill offenders (Andrews et al., 2006;

Canales, Campbell, Wei, & Totten, 2014; Ferguson et al., 2009; Girard & Wormith, 2004; Kingston et al., 2016; Skeem et al., 2014). The specific risk factors and subscales of these risk assessments are described below.

Criminal History

Criminal history is one of the strongest predictors of recidivism in offenders with mental illness, with more extensive criminal histories increasing the risk of general and violent recidivism (Bonta et al., 1998; Bonta et al., 2014; Lam, 2014). The criminal history subscale on the LS/CMI significantly predicted time to rearrest, return to custody, general and violent recidivism (Kingston et al., 2016; Skeem et al., 2014). According to Andrews and Bonta (2010), "criminal history reflects a history of rewards for criminal behavior and the longer and more varied the history, the more 'automatic' the behavior" (p. 225). Both juvenile delinquency and adult criminal history has been found to predict general and violent recidivism among offenders and noninstitutionalized individuals with mental illness (Bonta et al., 1998; Elbogen & Johnson, 2009). Offenders who have committed crimes in the past are more likely to commit crimes in the future (Bonta et al., 1998). Prior studies indicate that having prior felonies is predictive of committing a felony in the future (Lovell et al., 2002). More specifically, committing a violent felony has been found to increase the likelihood of future violence (Lovell et al., 2002). Having prior arrests was predictive of being rearrested two years after mentally ill offenders participated in the Brooklyn Mental Health Court (Reich et al., 2015). In a sample of mentally ill offenders discharged from a medium-secure hospital unit in the United Kingdom, having a greater number of prior convictions significantly predicted future offending (Phillips et al., 2005). Offenders' criminal or rule-breaking behavior in prison has also been found to predict future criminal

behavior. Offenders with prison infractions were at an increased likelihood of violence after release from prison (Lovell et al., 2002). More specific types of crime have also been found to predict general and violent recidivism among mentally ill offenders.

In some cases, type of prior offense has been found to predict future criminal behavior. For mentally ill offenders, having a nonviolent criminal history was predictive of both general and violent recidivism (Bonta et al., 1998), while having any type of prior violent offense was found to be "negatively related to general recidivism but positively related to violent recidivism" (Bonta et al., 1998, p. 135). When looking at specific types of violent crime, homicide or sexual offenses were found to be associated with less general recidivism (Bonta et al., 1998). Overall, violent crime (when defined broadly) appears to increase the odds of future violence, but does not increase the risk of general recidivism.

A history of violence has been found to predict criminal behavior in both noninstitutionalized and offender samples (Bonta et al., 1998; Elbogen & Johnson, 2009; Lam, 2014). Among a noninstitutionalized sample, individuals with mental illness who had a history of violence had an increased risk of future violence (Elbogen & Johnson, 2009). In a meta-analysis conducted by Bonta et al. (1998), having a history of violent behavior predicted both general (Zr = .10) and violent recidivism (Zr = .16) for offenders with mental illness.

History of Substance Abuse or Drug Crimes

Prior studies have found the substance use domain of the central/eight risk needs to predict general and violent recidivism among offenders with mental illness (Bonta et al., 1998; Bonta et al., 2014; Kingston et al., 2016; Lam, 2014). The substance abuse risk factor "is problems with alcohol and/or other drugs" and individuals who have a current problem are at a

higher risk than individuals who had a problem in the past (Andrews & Bonta, 2010, p. 60). The alcohol/drug problem subscale on the LS/CMI has also been found to be predictive of returning to incarceration for mentally ill offenders (Kingston et al., 2016; Skeem et al., 2014). Within this domain, Bonta et al. (1998) found substance abuse that involved general drug use significantly predicted general recidivism, but was not predictive of violent recidivism. In an updated meta-analysis, Bonta et al. (2014) found that general drug use did not significantly predict general recidivism, but did predict violent recidivism. Substance use or dependence was also found to predict violent behavior in a noninstitutionalized sample of persons with mental illness (Elbogen & Johnson, 2009). For offenders with mental illness, abusing an unspecified substance significantly predicted both general and violent recidivism (Bonta et al., 2014). Alcohol use predicted general recidivism, but did predict violent recidivism for offenders with mental illness (Bonta et al., 2014).

Crimes related to drugs have also been associated with future offending. For offenders with mental illness, drug related crimes have been associated with future offending behavior, with the number of prior drug felonies being positively associated with committing a new felony (Lovell et al., 2002). Meaning, mentally ill offenders who have committed more drug felonies are at an increased chance of committing a new drug felony.

Relationship with Family and Friends

For offenders with a mental illness, the family/marital domain has been found to be predictive of general and violent recidivism (Bonta et al., 1998; Bonta et al., 2014). For adults, this domain assesses the offender's marriage and the quality of the relationship. "The risk factor is poor-quality relationships in combination with either neutral expectations with regard to crime

or procriminal expectations" (Andrews & Bonta, 2010, p. 59). Within the marriage domain, being single predicted both general and violent recidivism for mentally ill offenders (Bonta et al., 1998; Bonta et al., 2014). Among a noninstitutionalized sample of people with mental illness, being divorced within the last year increased the risk of future violence (Elbogen & Johnson, 2009). Thus, individuals with a mental illness who are single are more likely to recidivate than individuals who are married.

Within the family domain, "poor living relationships and family dysfunction were significant predictors" of general and violent recidivism (Bonta et al., 1998, p. 127; Bonta et al., 2014). In some cases, having parents with a criminal history increased the risk of violence among a non-institutionalized sample of individuals with mental illness (Elbogen & Johnson, 2009).

The antisocial associates domain of the central eight risk/need factors "includes both association with pro-criminal others and relative isolation from anti-criminal others" (Andrews & Bonta, 2010, p. 59). This domain on the LSI-R significantly predicted general recidivism among mentally ill offenders (Canales et al., 2014). The companion's subscale of the LS/CMI significantly predicted recidivism, specifically, having antisocial companions was predictive of time until rearrested and general criminal recidivism (Kingston et al., 2016; Skeem et al., 2014). Having friends who condone and engage in criminal activity increases the likelihood of future criminal behavior for offenders with mental illness.

Factors Relating to Trauma

Having a history of abuse, sexual abuse, physical abuse, or intimate-partner violence are all indicators of trauma which can potentially increase the risk of recidivism. Having a history of

physical abuse increased the risk of violence among former psychiatric patients and noninstitutionalized individuals with mental illness (Elbogen & Johnson, 2009; Monahan et al., 2001). In a sample of individuals in the community with serious mental illness, having a history of childhood abuse or neglect significantly increased the risk of future violent behavior (Van Dorn, Volavka, & Johnson, 2012). Studies have also found victimization to predict future violence; in a noninstitutionalized sample, recent victimization and having a history of violent victimization significantly predicted future violence (Elbogen & Johnson, 2009; Lam, 2014). However, not all indicators of trauma have been found to significantly predict future criminal behavior in mentally ill offenders. In a meta-analysis examining the risk factors for violence, being a victim of childhood abuse did not significantly predict violence in individuals with mental illness (Lam, 2014). Sexual abuse (before the age of 20) did not significantly predict future violence for individuals discharged from a psychiatric hospital (Monahan et al., 2001). Indicators of trauma have inconsistently predicted general and violent recidivism for those with mental illness.

Demographics

Age has consistently been found to predict recidivism, being younger is predictive of both general and violent recidivism (Bonta et al., 1998; Lam, 2014; Lovell et al., 2002; Phillips et al., 2005). Gender is a risk factor for offenders with mental illness, with males at an increased risk of general and violent recidivism (Bonta et al., 1998; Cloyes et al., 2010; Lam, 2014; Lovell et al., 2002). However, gender has not been found to predict future violence in populations of former psychiatric patients or in offenders who were formerly hospitalized in a criminal unit (Monahan et al., 2001; Phillips et al., 2005). This indicates a possible difference between the

offender populations and community populations. Race has not been found to predict general recidivism, but minority race has been found to predict violent recidivism (Bonta et al., 1998; Lam, 2014).

There have been conflicting findings on the relationship between level of education and recidivism. Among offenders with mental illness, the domain of employment and education were not predictive of general recidivism (Bonta et al., 1998). However, in an updated meta-analysis, Bonta et al. (2014) found the education/employment domain predictive of general recidivism, although the effect size was small (d = .28). Lam (2014) found lower education significantly predicted violent behavior in offenders with mental illness. Similarly, the education and employment subscales of the LSI-R were one of the strongest predictors of general recidivism in a sample of medium-risk offenders participating in Saint John Mental Health Court (Canales et al., 2014). These predictors of general and violent recidivism have been more extensively studied in general offender populations.

Risk Assessment of Non-Mentally Ill Offenders

Offenders with no mental illness have many of the same risk factors as offenders with mental illness. Gendreau, Little, and Goggin (1996) conducted a meta-analysis of 131 studies to determine which risk factors and actuarial risk instruments were most predictive of recidivism for adult offenders. The third-generation risk assessment, LSI-R was found to be predictive of general recidivism (r = .36) and violent recidivism (r = .25) in general offender populations (Andrews et al., 2006; Caudy, Durso, & Taxman, 2013; Gendreau et al., 1996). The LSI-R contains theoretically relevant risk factors that are predictive of criminal behavior. The fourth-generation risk assessment, LS/CMI, has also been found to predict general recidivism (r = .41)

and violent recidivism (r = .29) in general offender populations (Andrews et al., 2006). The specific risk factors found to be predictive of recidivism are outlined below.

Criminal History

Adult criminal history has consistently been identified as a predictor of recidivism (Gendreau et al., 1996). Criminal history is the strongest predictor of offending and is considered one of the "Big Four" risk factors (Andrews & Bonta, 2010). The 10-item criminal history subscale of the LSI-R has been found to be predictive of recidivism for general offender populations. Having a more extensive criminal history has been found to increase the odds of recidivating for individuals on probation and for released inmates (Caudy et al., 2013). Extensive criminal history can include prior arrests, number of incarcerations, and a history of violence.

Specific risk factors in this domain include the number of prior arrests, which significantly predicts probation revocation (Degiorgio & DiDonato, 2014). Probationers with a greater number of felony arrests, total arrests, and number of incarcerations significantly increases the risk for probation revocation (Degiorgio & DiDonato, 2014). In a study of 272,111 offenders released from prison in 1994, offenders with one prior arrest had a 40.6% rate of rearrest within three years, offenders with two prior arrests had a 47.5% rearrest rate, and offenders with three prior arrests had a 55.2% rearrest rate (Langan & Levin, 2002). As the number of prior arrests increased, rearrest rates increased. Rezansoff et al. (2013) found offenders who had convictions in the 5-years prior to their current offense were three times more likely to recidivate. Total number of prior sentencing dates has also been a consistent predictor of violent and sexual recidivism in prior studies and is used in specific actuarial risk assessment

tools, such as the Static-99R, Static-2002R, and the Structured Anchored Clinical Judgement (SACJ; Grubin, 1998; Hanson & Thorton, 1999; Helmus & Thorton, 2015).

According to Langan and Levin (2002), the length of incarceration showed no association with recidivism rates. Other research has shown that offenders who serve a lengthy sentence have a decreased chance of recidivism. The longer the sentence, the less likely offenders were to recidivate. However, odds of recidivism did not decrease until an offender served at least five years in prison (Meade, Steiner, Makarios, & Travis, 2012). In Langan and Levin's (2002) study, offenders were incarcerated for an average of 58.9 months (*Mdn* = 48.0 months). Therefore, these offenders may not have been incarcerated long enough to detect a relationship between sentence length and recidivism.

Studies have shown offense type to differentially impact recidivism (Langan & Levin, 2002; Stahler et al., 2013). Offenders convicted of a property offense were rearrested more (73.8%) than violent offenders (67.1%) and drug offenders (62.2%) (Langan & Levin, 2002). Langan and Levin (2002) found offenders with the highest rate of reincarceration and reconviction had committed property offenses. Offenders who were convicted of homicide, sexual assault, rape, driving under the influence, and other violent offenses had the lowest rates of rearrest (Langan & Levin, 2002). This is consistent with the findings that offenders convicted of violent offenses are less likely to be reincarcerated than offenders committing a non-drug related or non-violent offense (Stahler et al., 2013).

Another indicator of criminal history is an offender's history of violence. Offenders who have a history of expressing their anger and hostility through physical force were found to be at a higher risk of having their probation revoked (Degiorgio & DiDonato, 2014). Having a history of

violence has been found to increase the risk of recidivism for non-mentally ill offenders. The level of risk varies depending on the victim of the offender's violence. Stalans, Yarnold, Seng, Olson, and Repp (2004) identified three categories of violent offenders: nonfamily only aggressors, family only aggressors, and generalized aggressors. In a sample of 1,344 violent probationers, 29.8% of generalized aggressors committed a new violent crime. These are offenders who were violent towards friends, family, acquaintances, and strangers. In comparison, 17.6% of family only aggressors and 12.2% of nonfamily only aggressors committed a new violent crime (Stalans et al., 2004). Of the three categories of violent offenders, probationers identified as generalized aggressors committed the greatest number of new violent crimes.

History of Substance Abuse or Drug Crimes

The substance abuse domain has been found to moderately predict recidivism (Andrews & Bonta, 2010; Gendreau et al., 1996). The substance abuse domain of the LSI-R is a moderate predictor of recidivism for non-mentally ill offenders (Andrews & Bonta, 2010; Caudy et al., 2013). Among probationers, having a history of alcohol and drug use was found to increase the risk of probation revocation (Degirorgio & DiDonato, 2014). Just being involved with drugs significantly increases the risk of reincarceration (Stahler et al., 2013). However, offenders who committed drug offenses were less likely to be reincarcerated compared to offenders who committed other types of nonviolent or nondrug related crimes (Stahler et al., 2013).

Relationship with Family and Friends

The family factors domain of the LSI-R is moderately predictive of recidivism (Andrews & Bonta, 2010). Family criminality, family rearing practices, and family structure are all predictors of recidivism (Gendreau et al., 1996). Single offenders were found to be more likely to

commit a new violent crime while on probation (Stalans et al., 2004). While marriage can serve as a protective factor when the relationship is of good quality and the partner is anti-criminal (Andrews & Bonta, 2010; Singh & Fazel, 2010), marriage can also provide social support that is necessary for offenders upon release from prison.

Having antisocial associates or companions is predictive of recidivism and is one of the strongest predictors of recidivism (Andrews & Bonta, 2010; Gendreau et al., 1996). Specifically, a lack of anti-criminal acquaintances and having some criminal acquaintances increases the risk of recidivism. In a sample of 11,146 offenders released from a correctional facility and 11,417 offenders on probation in the community, the antisocial peers domain of the LSI-R was predictive of criminal recidivism after controlling for criminal history, age, and gender (Caudy et al., 2013). Specific types of antisocial associates, such as gang members, can increase the chance for criminal behavior. Belonging to a gang has been found to increase the risk for criminal behavior (Andrews & Bonta, 2010; Olson, Dooley, & Kane, 2004). "Most individuals who join gangs already have a well-entrenched criminal propensity. However, being a gang member increases criminal behavior beyond what is expected from the individual" (Andrew & Bonta, 2010, p. 245). There can be more opportunity to engage in criminal activity when involved with the gang and is likely encouraged by fellow gang members.

Factors Relating to Trauma

In general offender populations, having a history of trauma has also been found to be predictive of future criminal activity. Prior research has found individuals with a history of abuse during childhood or adolescence (i.e., before 18 years old) were at an increased risk of violent and criminal behavior during adulthood (Widom, 1989). Having a history of trauma is also

predictive of specific types of criminal activity. Ireland and Windom (1994) found that having a history of childhood neglect, physical abuse or sexual abuse significantly predicted being arrested for an alcohol and/or drug related crime in adulthood.

Demographics

In a meta-analysis examining the predictors of criminal recidivism, Gendreau et al. (1996) found the age, race, and gender domain to be one of the strongest predictors of recidivism. Age has consistently been found to predict recidivism, with younger age being predictive of recidivism (Gendreau et al., 1996; Langan & Levin, 2002; Rezansoff et al., 2013; Stahler et al., 2013). Rezansoff et al. (2013) found that the risk of recidivism decreased by 3% with each yearly increase of age. Prior research has also found race to significantly predict recidivism among non-mentally ill probationers, with minorities having an increased risk of committing a new violent crime (Langan & Levin, 2002; Stalans et al., 2004).

Gender has been found to significantly predict recidivism, with males being more likely to recidivate than females (Becker et al., 2011; Gendreau et al., 1996; Langan & Levin, 2002; Stahler et al., 2013; Stalans et al., 2004). This is consistent across a variety of different definitions of recidivism, "men were more likely than women to be rearrested, reconvicted, returned to prison with a new prison sentence, and returned to prison with or without a new prison sentence" (Langan & Levin, 2002, p. 61). In a retrospective study of offenders released from jail, Becker et al. (2011) found when controlling for months in the community, race, age, and number of years eligible in their study, males "had a 15% greater odds of additional arrests compared to women" (p. 19). While Caudy et al. (2013) found, female offenders released from a correctional facility to have a 14% decreased likelihood of recidivating.

Education and employment are considered to be moderate predictors of recidivism (Andrews & Bonta, 2010). The education/employment domain of the LSI-R was predictive of recidivism for offenders released from correctional facilities and offenders on probation, after controlling for criminal history, age, and gender (Caudy et al., 2013). Rezansoff et al. (2013) found that the odds of recidivism decreased as educational achievement increased. This was also found in young offenders who participated in educational programming while incarcerated. Lipsey and Wilson (1998) found offenders who participated in an Adult Basic Education program had a 46% recidivism rate and those who received a GED had a 40% recidivism rate. Offenders who participated in post-secondary education had a 36% recidivism rate compared to a 50% recidivism rate for the comparison group. As the level of education increased, the rate of recidivism decreased.

Living in a neighborhood with high crime has been found to predict recidivism (Andrews & Bonta, 2010). Stahler et al. (2013) found that "recidivism is not randomly spatially distributed among ex-offender population but rather is spatially clustered into high and low recidivism regions of the city, and this has a particularly negative effect on those ex-prisoners from high incarceration rate regions" (p. 706). Therefore, offenders who live in areas with higher rates of recidivism are at an increased risk of recidivating.

The risk assessments used and the risk factors assessed in offenders without mental illness and with mental illness have also been examined in offenders with substance use disorders only and co-occurring disorders though, to a lesser extent.

Risk Factors: Substance Use Disorder and Co-Occurring Disorders

While there is a great deal of research indicating that offenders with co-occurring disorders are at an increased risk of recidivism and violence, there is less research examining the risk factors that are specific to offenders with a substance use disorder or a mental illness with a co-occurring substance use disorder. The LSI-R total scores have been found to predict recidivism among offenders and patients with a substance use disorder only or a mental illness with a co-occurring substance use disorder (Kelly & Welsh, 2008; Ogloff, Lemphers, & Dwyer, 2004). Patients in a forensic hospital who had a co-occurring disorder scored higher on each subscale of the LSI-R compared to offenders with only a mental illness (Ogloff et al., 2004). However, the LS/CMI has not been found to predict recidivism among offenders with a mental illness and co-occurring substance use disorder (Ferguson et al., 2009). This suggests that offenders with co-occurring disorders may have unique risk predictors that are not measured with this risk instrument. Some prior research has examined the specific risk factors of recidivism among these subgroups of mentally ill offenders.

Criminal History

Consistent with the risk assessment literature for non-mentally ill offenders and offenders with mental illness, criminal history is one of the strongest predictors of recidivism among offenders with substance use disorder and offenders with co-occurring disorders (Jaffe, Du, Huang, & Hser, 2012; Kelly & Welsh, 2008). Messina et al. (2004) compared drug offenders with no psychiatric disorder to offenders with a psychiatric disorder and a co-occurring substance use disorder (N = 8,500) using intake data and outcome evaluations of offenders who participated in a therapeutic community (TC) while incarcerated in California. Offenders with

co-occurring disorders had more extensive criminal histories than drug offenders (Messina et al., 2004). This may indicate that mentally ill offenders with co-occurring substance use disorders may engage in criminal activity more than offenders with a substance use disorder only and therefore, have a more extensive criminal history.

Offenders with a mental illness and co-occurring substance use disorder were more likely to be incarcerated multiple times over the course of six years compared to offenders with a mental illness only or a substance use disorder only (Baillargeon et al., 2010). In a retrospective study of 130 male offenders in Victoria, Australia, offenders with co-occurring disorders were significantly more likely to have a history of incarcerations compared to offenders with no mental illness or only a mental illness (Ogloff, Talevski, Lemphres, Wood, & Simmons, 2015). Similar to offenders with mental illness, drug offenders and offenders with co-occurring mental illness and substance use disorder, the "total number of years in prison in lifetime was significantly associated with an increased likelihood of reincarceration" (Messina et al., 2004, p. 514).

The differences in current conviction offense has also been examined in these subtypes of mentally ill offenders. Offenders with a serious mental illness were significantly more likely to be arrested for drug, property, or other offenses when using substances compared to when they are not using substances (Swartz & Lurigio, 2007). Håkansson and Berglund (2012) examined patterns of substance abuse and potential predictors of recidivism in prisoners in Sweden. Having a current conviction for a drug related offense was protective of recidivism, while having a current conviction for a property crime was predictive of recidivism. Therefore, offenders who

committed drug offenses were less likely to recidivate than offenders who committed nondrug offenses.

Having a history of violence has also been found to predict recidivism in offenders with substance use disorders and co-occurring disorders. Offenders with a substance use disorder who had difficulty controlling violent behavior were found to be at a higher risk of recidivism (Håkansson & Berglund, 2012). Offenders with a mental illness and co-occurring substance use disorder, compared to offenders with only a mental illness or no mental illness, were significantly more likely to have a history of violent offending and a history of personal violence (Ogloff et al., 2015).

History of Substance Abuse or Drug Crimes

The drug and alcohol problem subscale on the LSI-R has been found to accurately predict recidivism in drug offenders (Kelly & Welsh, 2008). Those with a greater problem with drugs and alcohol were more likely to recidivate. Greater recent use of alcohol was also found to predict rearrest among a sample of offenders with co-occurring disorders (Jaffe et al., 2012). In a meta-analysis examining both non-mentally ill and mentally ill offender populations Dowden and Brown (2002), examined the role substance abuse factors played in predicting recidivism. Dowden and Brown (2002) found prior substance abuse charges were negatively associated with recidivism, meaning offenders were less likely to recidivate when they had a prior substance abuse related charge. This is consistent with the findings for non-mentally ill offenders.

Relationship with Family and Friends

Offenders with a mental illness and co-occurring substance use disorder were significantly more likely to have anti-social companions compared to offenders with mental illness only (Ferguson et al., 2009). Similarly, patients in a forensic psychiatric hospital in Victoria, Australia who had a mental illness and co-occurring substance abuse disorder scored higher on the family/marital subscale and the companions subscale of the LSI-R compared to patients with only a mental illness (Ogloff et al., 2004). Scoring higher on these subscales indicates that offenders with a mental illness and co-occurring substance use disorder may have more procriminal companions and more problems in the marital/family domain than those without only a mental illness.

Demographics

Consistent with non-mentally ill and mentally ill offenders, being younger was predictive of general and violent recidivism among offenders with a substance use disorder (Håkansson & Berglund, 2012). Older age was a protective factor of rearrest among a sample of offenders with mental illness and a co-occurring substance use disorder (Jaffe et al., 2012). Meaning, older offenders with COD were less likely to be rearrested than younger offenders with COD. Among drug offenders and offenders with co-occurring mental illness and substance use disorder, older offenders were less likely to return to corrections (Messina et al., 2004). The finding that younger offenders are more likely to recidivate is consistent across the four types of offenders examined in this thesis.

Gender was predictive of recidivism among offenders with substance use disorders, with males having a greater likelihood of returning to the criminal justice system (Håkansson &

Berglund, 2012). Among drug offenders and offenders with co-occurring mental illness and substance use disorder, men were more likely to return to corrections than women (Messina et al., 2004). Gender has been found to significantly predict recidivism across the four categories of mental health.

Unlike the findings for mentally ill and non-mentally ill offenders, race did not significantly predict recidivism for offenders with substance use disorders (Kelly & Welsh, 2008). Among drug offenders and offenders with co-occurring mental illness and substance use disorder, race did not significantly predict recidivism (Messina et al., 2004).

As with non-mentally ill offenders, education is a significant predictor of recidivism. Offenders with co-occurring disorders who had higher levels of education were less likely to be rearrested than offenders with lower levels of education (Jaffe et al., 2012). Among drug offenders and offenders with a COD, offenders with a higher level of education were less likely to be reincarcerated (each year of education reduced odds; Messina et al., 2004). These findings are consistent with the findings in non-mentally ill offenders.

Current Study

Additional research is needed to identify the risk factors that are specific to individuals with substance use disorder and mental illness with a co-occurring substance use disorder. This thesis examines which risk factors are predictive of recidivism among individuals with no mental illness, a non-substance abusing mental illness only, a substance use disorder only, or with a co-occurring mental illness and substance use disorder. The predictors of being returned to prison or being rearrested for a violent, property, or drug crime are compared across the four mental health categories. Prior research has focused mainly on measuring general recidivism and violent

recidivism (Bonta et al., 1998; Bonta et al., 2014; Dowden & Brown, 2002; Gendreau et al., 1996). This study examines general and violent recidivism but also examines two specific forms of recidivism that have received limited empirical attention: new arrests for drug possession and new arrests for property crime.

CHAPTER TWO

METHODS

Sampling

A secondary data analysis was conducted on data obtained by Olson, Stalans, and Escobar (2016) for a study on general and violent recidivism among male and female inmates released from the Illinois Department of Corrections (IDOC) in 2007. The data contained the information that is routinely collected about an inmate during the intake process by IDOC, and was electronically available. Recidivism measures, based on new arrests, were collected in 2010 from the Illinois State Police to examine if the inmates were arrested during the first three years (on average) after being released from prison. The current sample consisted of 20,978 men and women released from IDOC in 2007 out of a total sample of 34,150. The sample was restricted to individuals who had completed the intake interview and were admitted to IDOC for a new sentence. From the original dataset, individuals who were incarcerated for a technical violation of their parole were excluded because individuals returned for a technical violation have already recidivated (n = 7,532). Individuals who were missing the intake interview (n = 4,641) were excluded from the final sample. Individuals who had died while incarcerated or those who were deported upon released were excluded (n = 84). Individuals who were missing data used to identify those with a mental illness were also excluded (n = 6). The final sample further excludes cases with missing data for any of the predictor variables. The variable with the most missing data, prior sentencing dates, had 3.7% (n = 816) of cases missing data. Predictor variables with

less than 1% of missing cases included: prior drug possession (n = 132), prior violent crimes (n = 132), prior property crimes (n = 132), prior arrests for violating an order of protection (n = 132), history of violence (n = 132), family members currently or previously incarcerated in IDOC (n = 9), marital status (n = 10), race (n = 4), and education (n = 86).

Sample

After restricting the sample, there were 20,978 released inmates. Males accounted for 87.8% of the sample (n = 18,424) and females accounted for 12.2% of the sample (n = 2,554). Majority of individuals were Black (60.1%, n = 12,598), followed by Whites (28.5%, n = 5,978), and Hispanics and others (11.5%, n = 2,402). The inmates age at release ranged from 17 to 79 years old (M = 33.34, SD = 10.26). Majority of individuals did not graduate high school or obtain a GED (54.5%, n = 11,439), compared to 45.5% of individual's who graduated high school or earned a GED (n = 9,539). Majority of individuals were committed to IDOC from Cook County (55.7%, n = 11,680), 21.9% were committed from other urban counties outside of Cook County and the collar county region (n = 4,595), 14.3% were committed from the collar counties (i.e., Lake, McHenry, Kane, DuPage, and Will County; n = 2,999), and 8.1% were committed from rural counties (n = 1,704).

Measurement of Mental Illness

Classification of Prisoners with Substance Use Disorder

The Texas Christian University (TCU) Drug Screen II was used to identify individuals with a substance use disorder within the sample (Knight, Simpson, & Hiller, 2002). The TCU Drug Screen II was administered by IDOC to individuals who were required to take the screen. The TCU Drug Screen II contains 15 questions about the individuals drug and alcohol use during the twelve months preceding their incarceration. Each question from the TCU Drug Screen II

was included in the data from IDOC. The TCU Drug Screen II total score can range from 0 to 9. A score of 3 or higher signifies a "relatively severe drug-related problems" and meets the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria for a drug dependence diagnosis (Knight et al., 2002, p. 75). Individuals who had a score of 3 or higher on the TCU Drug Screen II were coded as having a substance abuse disorder. Scores were calculated for each individual and a dummy-coded variable was created, 40.3% of individuals were identified as having a substance use disorder (n = 8,449, coded as one) and 59.7% of individuals did not meet the criteria of having a substance use disorder (n = 12,529, coded as zero). The TCU Drug Screen II has a Cronbach's Alpha coefficient of .89, indicating it is a reliable measure to screen for drug use.

Classification of Prisoners with Mental Illness

Individuals with a serious mental illness were identified in the data by examining each person's self-reported current need for mental health treatment, current medication, and symptoms and behaviors related to mental health. Individuals were coded as having a current mental illness if any of the following applied to them: (a) recommended to mental health programming at intake (18.4%); (b) referred to psychiatric facilities (Dixon Psych, Dixon STC, or Dwight WETC; 1.1%); (c) reported taking medication for a mental illness at the intake interview (i.e., anti-depressants, 13.4%; mood stabilizers, 3.9%; or other medication for mental health or emotional issues, 9.5%); (d) reported seeing or hearing things that others have not (3.3%); (e) reported feeling depressed (8.8%); (f) reported self-harm or a suicide attempt within the past ten years (6.5%). These indicators of mental illness were combined into a dummy-coded variable, individuals with at least one indicator of mental illness were coded as one (22.9%, n =

4,804) and individuals who had no indicators of mental illness were coded as zero (77.1%, *n* = 16,174).

Classification of Prisoners with Co-Occurring Disorders

Individuals were classified as having a co-occurring disorder if they were identified in the data as having both a substance use disorder and a mental illness. A dummy-coded variable was created, with 9.9% of individuals identified as having a co-occurring disorder (*n* = 2,083, coded as one) and 90.1% of individuals did not have a co-occurring disorder (*n* = 18,895, coded as zero).

The dummy-coded variables created for the classification of substance use disorder, mental illness, and co-occurring disorder were recoded to ensure that individuals identified as having a co-occurring disorder were not included in the classification of only substance use disorder or only mental illness. A multichotomous variable representing each mental illness category was created, resulting in 30.3% of individuals being identified as having only a substance use disorder (*n* = 6,366, coded as zero), 13% of individuals identified as having a non-substance related mental illness (*n* = 2,721, coded as one), 9.9% of individuals identified as having a co-occurring disorder (*n* = 2,083, coded as two), and 46.8% of individuals identified as having no mental illness (*n* = 9,808, coded as three).

Measurement of Outcomes

The dataset contained recidivism and criminal history data from the Illinois State Police after inmates were released from prison, with an average follow-up period of 1,216 days or about 3.4 years (Olson et al., 2016). Four distinct measures of recidivism were used to assess if an individual was rearrested for a new crime or returned to prison after being released from prison. A dummy-coded variable was used to measure new unique arrest dates for any misdemeanor or

felony violent crime during the follow-up period, with 28.9% of individuals being rearrested one or more times for a violent crime (n = 6,072, coded as one) and 71.1% of individuals not being rearrested for a violent crime (n = 14,906, coded as zero). Violent crimes include: homicide, robbery, domestic violence, sexual assault/abuse, assault, battery, violation of order of protection and stalking. A dummy-coded variable was used to measure new unique arrest dates for any felony property crime or deceptive practices during the follow-up period, with 13.1% of individuals arrested for a new felony property crime or deceptive practice (n = 2,756, coded as one) and 86.9% of individuals not being rearrested (n = 18,222, coded as zero). Felony property crimes include: theft, burglary, robbery, arson, shoplifting and vandalism. A continuous variable was used to measure the number of new unique arrest dates for any misdemeanor or felony drug possession (not including possession or sale of marijuana or illegal alcohol). The number of new unique arrest dates for drug possession or drug sales ranged from 0 to 18 with 39.4% of individuals having one or more new unique arrests (Mdn = 0.00, SD = 1.43). A dummy-coded variable was used to measure individuals returned to prison after release, 46% of individuals were returned to prison (n = 9,653, coded as one) and 54% of individuals did not return to prison (n = 11,325, coded as zero). The return to prison outcome measures both new convictions and technical violations. New convictions capture new criminal activity, while technical violations capture how well releasees comply with the conditions and enforcement practices of their parole officers.

Rearrest for violent crime and rearrest for property crime were both measured as dichotomous outcomes due to the skewness of the distribution, only 5.2% of the sample had 3 to 17 new violent crimes, and only 3% the sample had 2 or more property crimes. The prior research generally has focused only on general (all) recidivism and violent recidivism; thus, to be

consistent with the prior research on violent recidivism, a dichotomous measure of violent recidivism was used. However, the rearrest for drug offenses outcome was kept as a continuous variable because the distribution of this outcome variable revealed a more substantial percentage of individuals who had 2 new arrests (9.7%) and 3 through 18 new arrests (10.9%) for drug possession after release from prison. Therefore, reducing this outcome to a dichotomous measure of recidivism would have resulted in a substantial loss of information about the repeat nature of this recidivism across the three years postrelease, and would misrepresent the natural relapses in substance abuse that occur.

Measurement of Predictors

Four categories of predictors were used in the analyses: criminal history, relationships with family and friends, history of trauma, and demographics.

Criminal History Variables

Offense type at admittance to prison. Two dummy-coded variables were used to determine if a person was most recently incarcerated for a violent, property, or other crime. Other crimes, which were primarily drug crimes, served as the reference group and were always coded as zero (44.2%, n = 9,276). In the first dummy-coded variable, violent crimes were coded as one (20.1%, n = 4,215) and all others were coded as zero. In the second dummy-coded variable, property or other crimes were coded as one (35.7%, n = 7,487) and all others were coded as zero.

Length of time served. An ordinal variable was used to measure the length of time served in an individual's most recent period of incarceration: 67.2% of individuals served less than 12 months (n = 14,105, coded as zero), 21% of individuals served between 12 and 24

months (n = 4,398, coded as one), and 11.8% of individuals served 25 months or more (n = 2,475, coded as two).

Unique prior arrests. Four categories of unique prior arrests were examined: drug possession (not including possession of marijuana), violent crime, property crime, and violating an order of protection. Prior arrest for drug possession, violent crime, and violating an order of protection included arrests for both misdemeanors and felonies, but prior arrest for property crime only included arrests for felonies. Prior number of unique arrests for drug possession was recoded to reflect the number of arrests ranging from 0 to 10 and a category of "11 or more arrests" was created to address outliers (Mdn = 1, SD = 2.7). Prior number of unique arrests for a violent crime was recoded to reflect the number of arrests ranging from 0 to 10 and a category of "11 or more arrests" was created to address outliers (Mdn = 2, SD = 2.99). These two prior arrest variables were recoded due to the skewness of the distribution, only 3.7% of the sample had 12 to 63 prior arrests for a violent crime, and only 1% had 12 to 33 prior arrests for drug possession. Unique prior arrests for property crime was recoded into a categorical variable, 63.2% of individuals had no prior arrests for property crimes (n = 13,262, coded as zero), 19% had one prior arrest (n = 3,994, coded as one), and 17.7% had two or more prior property arrests (n = 3,722, coded as two). Prior arrest for property crime was recoded due to the skewness of the distribution, only 9.2% of the sample had 3 to 23 prior arrests for a property crime. The number of unique prior arrests for violating an order of protection was recoded into a dummy-coded variable, 7.2% of individuals had been arrested for violating an order of protection in the past (n = 1,519, coded as one) and 92.8% of individuals had not (n = 19,459, coded as zero). This variable was recoded due to skewed distribution, only 2.7% of the sample had 2 to 16 prior arrests for violating an order of protection.

Total sentencing dates A continuous variable was used to measure an individual's total number of occasions they had sentencing hearings for all convictions (i.e., prior number of sentencing dates as found in the Static-99, Static-2002, SACJ, and Matrix-2000) (*Mdn* = 7, *SD* = 7.29). This variable was recoded to reflect the number of total sentencing dates ranging from 0 to 29 and a category of "30 or more total sentencing dates" was created to address outliers.

Number of incarcerations. A continuous variable was used to measure the total number of times an individual had been incarcerated in prison in Illinois, including the most recent incarceration, this ranged from one to five incarcerations (*M* = 2, *SD* = 1.4).

Disciplinary incidents. An ordinal variable was used to measure disciplinary incidents during an individual's most recent period of incarceration: 43.1% of individuals had no disciplinary incidents (*n* = 9,042, coded as zero), 30.3% of individuals had one to two incidents (*n* = 6,366, coded as one), 14% of individuals had three to five incidents (*n* = 2,937, coded as two), and 12.6% of individuals had six or more incidents (*n* = 2,633, coded as three).

History of violence. Three dummy-coded variables were used to determine if an individual had no history of violence, had a history of violence with family members only, had a history of violence with nonfamily members only, or were considered generalized aggressors. Individuals who were considered generalized aggressors consisted of 29.6% of the sample and served as the reference category, which was always coded as zero (*n* = 6,203). The first dummy-coded variable revealed 20.7% of individuals had no history of violence (*n* = 4,339, coded as one) and all others were coded as zero. The second dummy-coded variable revealed 5% of individuals had a history of violence with family members only (*n* = 1,054, coded as one) and all others were coded as zero. The third dummy-coded variable revealed 44.7% of individuals had a

history of violence with nonfamily members only (n = 9,382, coded as one) and all others were coded as zero.

Days at risk. The number of actual days at risk for rearrest was calculated for each person included in the study. Number of days at risk for rearrest measured the number of days between when a person was released from IDOC to the end of the follow-up period, minus any days a person was back in prison for a new sentence or a technical violation. However, the number of days at risk does not account for any potential time spent in jail. The number of days at risk ranged from 0 to 1,399 (Mdn = 1,116 SD = 259.69).

Relationships with Family and Friends

Pro-criminal companions. Gang affiliation was used to measure whether a person had pro-criminal companions. Gang affiliation was based on IDOC intelligence information and measured whether an individual identified as a gang member while incarcerated. A dummy-coded variable was used to determine if a person was gang affiliated, indicating that 29.8% of individuals were gang affiliated (n = 6,249, coded as one) and 70.2% were not gang affiliated (n = 14,729, coded as zero).

Incarcerated family members. Individuals indicated if any family members were previously or currently incarcerated in IDOC. Family members incarceration history does not include incarcerations in other states or in jails. A dummy-coded variable revealed 5% of individuals did have family previously or currently incarcerated at IDOC (n = 1,049, coded as one) and 95% of individuals did not (n = 19,929, coded as zero).

Marital status. A dummy-coded variable was used to measure an individual's marital status, indicating 83.7% of individuals were not married (n = 17,553, coded as one) and 16.3% of individuals were married (n = 3,425, coded as zero).

History of Trauma

The measure of trauma included individuals who had self-reported being traumatized through sexual, physical, intimate-partner violence, abuse, combat veteran, or suicide. A dummy-coded variable was used, 17.1% of individuals had a history of trauma (n = 3,586, coded as one) and 82.9% of individuals did not have a history of trauma (n = 17,392, coded as zero).

Demographics

Age at release. A continuous variable was used to measure inmate's exact age at the time of their release from prison. individuals age at release ranged from 17 to 79 years old (M = 33.34, SD = 10.26).

Gender. Gender was measured with a dummy-coded variable, males accounted for 87.8% of the sample (n = 18,424, coded as one) and females accounted for 12.2% of the sample (n = 2,554, coded as zero).

Race. Two dummy-coded variables were used to assess a person's self-reported race, with White serving as the reference group and always coded as zero. Majority of individuals identified as were Black, followed by White, and Hispanic or other. Within the sample, 28.5% of people identified as White, this served as the baseline and was always coded as zero (n = 5,978). In the first dummy-coded variable, individuals who identified as Black were coded as one (60.1%, n = 12,598) and all others were coded as zero. In the second dummy-coded variable, individuals who identified as Hispanic or other (Asian or Native American) were coded as one (11.5%, n = 2,402) and all others were coded as zero.

Education. A dummy-coded variable was used to measure level of education, individuals who did not graduate high school or did not receive a GED were coded as one (54.5%, n =

11,439). Individuals who graduated high school or received a GED were coded as zero (45.5%, *n* = 9,539).

Committing county. A categorical variable was used to measure which region individuals were convicted in when they were committed to IDOC. The majority of individuals were committed to IDOC from Cook County (55.7%, *n* = 11,680), followed by: other urban counties outside of Cook and the collar counties (21.9%, *n* = 4,595), the collar counties (14.3%, *n* = 2,999), and rural counties (8.1%, *n* = 1,704).

CHAPTER THREE

RESULTS

The results section is organized into three major sections: examining the sample for selection bias, bivariate analysis, and the multivariate analysis. Due to the large sample size, results may be statistically significant, but not practically significant. Therefore, the *p*-value alone is not sufficient to evaluate significance. For all analyses, a criterion was established for practical significance. Results were considered statistically significant at the level of $p < .01$ and practical significance for correlations was set at 0.10 (1% of the variance explained).

Examining Selection Bias

To examine selection bias, chi-square analyses and independent samples *t* tests compared individuals with and without an intake interview on all 24 predictors. The electronic form of the intake interview process was introduced in the early 2000s, therefore the sample that relies on these intake interviews will exclude those admitted to prison prior to the implementation of the electronic intake interview process (e.g., individuals with long lengths of stay and individuals convicted of a violent offense). Table 1 presents the categorical predictors that showed statistical significance ($p < .01$) and practical significance with Phi or Cramer's *V* correlations of .10 or higher. As shown in Table 1, individuals admitted to prison for a nonviolent crime were more likely to have their intake interview than those admitted to prison for a violent crime. Individuals from Cook County or its collar counties were more likely to have their intake interview than individuals from other suburban or rural counties. As shown in Table 1, 46.1% of those serving.

at least 25 months and 54.9% of individuals with six or more interdisciplinary violations had intake interviews, whereas most of their counterparts (79.4% to 95.1%) had no intake interviews. Independent sample's *t* tests and Spearman's Rho were also conducted to determine statistical and practical significance of all continuous variables. The sample with intake interviews had a higher mean number of prior arrests for drug possession ($M = 2.2$, $SD = 2.7$) than those without intake interviews ($M = 1.2$, $SD = 1.99$), ($t(26308) = 22.58$, $p < .001$, $r_s = -.15$, $p < .001$). Thus, the sample tends to over represent those from urban counties, with longer time served, a greater number of disciplinary violations, and those convicted of violent offenses than the population of individuals in Illinois prisons during this time period. Individuals missing their intake interview ($n = 4{,}641$) were removed from the sample for all subsequent analyses. The final sample contains 20,977 released inmates.

Table 1. Bivariate Relationship Between Intake Interview and Predictors

	Persons with Intake Interview ($n = 21{,}893$)	Persons Missing Intake Interview ($n = 4{,}641$)
Offense Type	$\chi^2 = 1026.91$, $df = 1$, $p < .001$, $\varphi = -.20$, $p < .001$	
Nonviolent crime	86.7%	13.3%
Violent crimes	69.2%	30.8%
Committing County	$\chi^2 = 1118.15$, $df = 3$, $p < .001$, Cramer's $V = .21$, $p < .001$	
Cook county	87%	13%
Collar county	90.6%	9.4%
Other urban counties	76.1%	23.9%
Rural counties	65.2%	34.8%
Disciplinary Incidents in Prison	$\chi^2 = 3734.6$, $df = 4$, $p < .001$, Cramer's $V = .38$, $p < .001$	
None	93.3%	6.7%
1 to 2	87.8%	12.2%
3 to 5	79.4%	20.6%
6 or more	54.9%	45.1%
Length of Time Served	$\chi^2 = 6835.52$, $df = 2$, $p < .001$, Cramer's $V = .51$, $p < .001$	
< 12 months	95.1%	4.9%
12-24 months	83.7%	16.3%
25 months or more	46.1%	53.9%

Bivariate Analyses Comparing Mental Health Categories

Bivariate analyses were conducted to examine the relationship between mental health categories and each predictor, and between the mental health categories and each outcome.

Criminal History

Chi-square analyses and multivariate analysis of variance (MANOVA) were conducted to examine the relationship between the criminal history predictor of interest and the four mental health categories. Table 2 presents the chi-square analyses and Cramer's *V* values for the nine dichotomous and categorical criminal history predictors. As shown in Table 2, the mental health groups had similar criminal history backgrounds on all measures, except for having a property crime offense at admission to prison. Individuals with a non-SUD MI (47.1%) and those with a COD (44.6%) were more likely to be admitted to prison for a property crime than were those with only a SUD (32.2%) and those without MI (32.9%).

Table 3 presents the means, standard deviations, and MANOVA tests comparing the four mental health groups on the five continuous criminal history predictors. Eta squared was used to measure the strength of the relationship. The mental health groups had similar criminal history across these five measures: prior arrests for a drug crime ($M = 2.22$, $SD = 2.71$), prior arrests for a violent crime ($M = 2.9$, $SD = 2.99$), total sentencing dates ($M = 9.38$, $SD = 7.29$), number of incarcerations ($M = 2.23$, $SD = 1.4$), and days at risk ($M = 1059.21$, $SD = 259.69$).

Table 2. Bivariate Analysis: Categories of Mental Illness and Criminal History

	Substance Use Disorder (n = 6,366)	Non-Substance Using Mental Illness (n = 2,721)	Co-Occurring Disorder (n = 2,083)	Without Mental Illness (n = 9,808)
Offense on Admission to Prison				
Violent Crime	χ^2 = 53.41, df = 3, p < .001, Cramer's V =.05, p < .001			
Nonviolent crime	82.2%	79.2%	82.8%	78.0%
Violent crime	17.8%	20.8%	17.2%	22.0%
Property Crime	χ^2 = 293.16, df = 3, p < .001, Cramer's V = .12, p < .001			
Non-property crime	67.8%	52.9%	55.4%	67.1%
Property crime	32.2%	47.1%	44.6%	32.9%
Length of Time Served	χ^2 = 351.95, df = 6, p < .001, Cramer's V = .09, p < .001			
<12 months	58.8%	72.5%	68.5%	71.0%
12-24 months	24.3%	18.4%	21.7%	19.3%
25 months or more	16.8%	9.2%	9.8%	9.7%
Prior Arrest: Property Crime	χ^2 = 125.76, df = 6, p < .001, Cramer's V = .06, p < .001			
No arrests	61.2%	62.2%	55.4%	66.5%
1 arrest	19.9%	19.2%	21.2%	18.0%
2 or more arrests	19.0%	18.6%	23.4%	15.5%
Prior Arrest: Violating an Order of Protection	χ^2 = 41.75, df = 3, p < .001, Cramer's V = .05, p < .001			
No	93.0%	91.1%	90.2%	93.6%
Yes	7.0%	8.9%	9.8%	6.4%
Prison Disciplinary Incidents	χ^2 = 275.35, df = 9, p < .001, Cramer's V = .07, p < .001			
None	37.7%	43.6%	38.6%	47.5%
1 to 2	30.2%	29.4%	32.5%	30.2%
3 to 5	15.8%	14.0%	15.0%	12.6%
6 or more	16.4%	13.0%	13.9%	9.6%
History of Violence	χ^2 = 27.4, df = 3, p < .001, Cramer's V = .04, p < .001			
Prior History	80.7%	76.0%	78.4%	79.5%
No Prior History	19.3%	24.0%	21.6%	20.5%
History of Family Only Violence	χ^2 = 6.03, df = 3, p = .11			
No	94.9%	94.3%	95.8%	95.1%
Yes	5.1%	5.7%	4.2%	4.9%
History of Nonfamily Only Violence	χ^2 = 13, df = 3, p < .01, Cramer's V = .03, p < .01			
No	54.6%	57.3%	57.8%	54.6%
Yes	45.4%	42.7%	42.2%	45.4%

Note. Statistical and practical significance if p < .01, and Cramer's $V \geq .10$.

Table 3. Means for Continuous Criminal History Variables

	Substance Use Disorder (n = 6,366)	Non-Substance Using Mental Illness (n = 2,721)	Co-Occurring Disorder (n = 2,083)	Without Mental Illness (n = 9,808)
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Prior Arrests: Drug Possession $F(3, 20974) = 52.71$, $p < .001$, $\eta^2 = .007$	2.51 (2.86)	1.76 (2.47)	2.1 (2.64)	2.19 (2.7)
Prior Arrests: Violent Crime $F(3, 20974) = 8.92$, $p < .001$, $\eta^2 = .001$	2.93 (2.93)	2.83 (3.12)	3.2 (3.28)	2.84 (2.93)
Total Sentencing Dates $F(3, 20974) = 36.97$, $p < .001$, $\eta^2 = .005$	9.54 (7.15)	9.89 (7.93)	10.53 (8.09)	8.9 (6.97)
Number of Incarcerations $F(3, 20974) = 34.31$, $p < .001$, $\eta^2 = .005$	2.28 (1.4)	2.3 (1.46)	2.43 (1.49)	2.13 (1.36)
Days at Risk $F(3, 20974) = 22.61$, $p < .001$, $\eta^2 = .003$	1044.01 (267.18)	1074.43 (249.72)	1034.34 (263.23)	1070.14 (255.83)

Note. Multivariate analysis of variance results: $F(15, 57889.34) = 30.51$, $p < .001$, Wilks $\Lambda = .98$, partial $\eta^2 = .007$.

Social Background Characteristics

Table 4 presents the chi-square analyses and Cramer's *V* correlations comparing the four categories of mental health on the eight social background characteristics. As shown in Table 4, the mental health groups were similar on half of the social backgrounds characteristics: gang affiliation, history of family members incarcerated in IDOC, marital status, and education. The mental health groups were different on the other half of these social background characteristics: history of trauma, gender, race, and committing county. Individuals with a COD and those with a non-SUD MI were similar to each other and different from those with only a SUD and those without a MI. As shown in Table 4, those in the COD group or the non-SUD MI group were more likely to come from other urban counties than those with a SUD or without a MI. Those in

the non-SUD MI group or COD group were about equally comprised of Whites and Blacks. While about two-thirds of those without MI or with only a SUD were Black and roughly one-fourth were White. A little over half of the COD and non-SUD MI groups had a history of trauma whereas only six to five percent of those with SUD or without MI had this history. The vast majority of these groups (over 90%) were male whereas those with a non-SUD MI were more evenly split with 59.2% males and 41.9% females, and those with a COD comprised of 79.7% males and 20.3% females.

An analysis of variance (ANOVA) revealed a practically significant difference in age at release across the four mental health categories ($F(3, 20974) = 111.98$, $p < .001$, $\eta^2 = .02$), with two percentage of the variance in age accounted for by the mental health categories. However, a Tukey's HSD test indicated that there was not a statistically significant difference in the mean age at release for individuals with a non-SUD MI verse individuals with a COD. Individuals with SUD were on average 33.48 years old when released from prison ($SD = 9.98$), compared to 35.43 ($SD = 10.16$) for individuals with non-SUD MI, 33.55 years old ($SD = 9.66$) for individuals with COD, and 32.2 years old ($SD = 10.43$) for individuals without a MI.

Table 4. Bivariate Analysis: Categories of Mental Illness and Social Background Characteristics

	Substance Use Disorder (n = 6,366)	Non-Substance Using Mental Illness (n = 2,721)	Co-Occurring Disorder (n = 2,083)	Without Mental Illness (n = 9,808)
Gang Affiliated	$\chi^2 = 177.8$, $df = 3$, $p < .001$, Cramer's $V = .09$, $p < .001$			
No	65.0%	78.4%	73.0%	70.7%
Yes	35.0%	21.6%	27.0%	29.3%
Family Members Ever Incarcerated in IDOC	$\chi^2 = 79$, $df = 3$, $p < .001$, Cramer's $V = .06$, $p < .001$			
No	95.3%	92.1%	93.5%	95.9%
Yes	4.7%	7.9%	6.5%	4.1%
Marital Status	$\chi^2 = 13.28$, $df = 3$, $p < .01$, Cramer's $V = .03$, $p < .01$			
Married	16.2%	18.7%	16.2%	15.8%

Not married	83.8%	81.3%	83.8%	84.2%
History of Trauma	$\chi^2 = 6685.39$, $df = 3$, $p < .001$, Cramer's $V = .57$, $p < .001$			
No	93.9%	42.1%	46.4%	94.8%
Yes	6.1%	57.9%	53.6%	5.2%
Gender	$\chi^2 = 2789.52$, $df = 3$, $p < .001$, Cramer's $V = .37$, $p < .001$			
Female	3.9%	40.8%	20.3%	7.9%
Male	96.1%	59.2%	79.7%	92.1%
Race	$\chi^2 = 1014.96$, $df = 6$, $p < .001$, Cramer's $V = .16$, $p < .001$			
White	25.5%	45.5%	47.1%	21.7%
Black	62.2%	48.1%	45.7%	65.0%
Hispanic/Other	12.3%	6.4%	7.2%	13.2%
Education	$\chi^2 = 69.81$, $df = 3$, $p < .001$, Cramer's $V = .06$, $p < .001$			
GED or HS diploma	43.9%	51.3%	49.9%	43.9%
No GED or HS diploma	56.1%	48.7%	50.1%	56.1%
Committing County	$\chi^2 = 698.88$, $df = 9$, $p < .001$, Cramer's $V = .11$, $p < .001$			
Cook county	57.3%	39.4%	43.7%	61.7%
Collar counties	14.0%	15.3%	14.5%	14.2%
Other urban counties	21.3%	31.9%	28.9%	18.1%
Rural counties	7.5%	13.5%	13.0%	6.0%

Note. HS = High school; GED= general equivalency diploma. Statistical and practical significance if $p < .01$, and Cramer's $V \geq .10$.

Outcomes

Across these four mental health groups, 28.9% were rearrested for a violent crime, 13.1% were rearrested for a property crime, and 46% returned to prison. Table 5 presents the chi-square analyses and Cramer's *V* correlations comparing the four categories of mental health with the three dichotomous measures of recidivism: arrest for a violent crime, arrest for a property crime, or return to prison. As shown in Table 5, the four mental health groups had similar rates of recidivism on all measures. An ANOVA was used to compare the mental health categories on the continuous outcome measure: arrest for drug possession. Eta squared was used to measure the strength of the relationship. Individuals with a non-SUD MI had slightly less mean arrests for drug possession after release from prison ($M = .62$, $SD = 1.23$) compared to individuals with COD ($M = .74$, $SD = 1.29$), SUD ($M = .85$, $SD = 1.38$), and individuals without an MI ($M = .89$,

SD = 1.53). Across these four mental health groups, there was an average of 0.83 (*SD* = 1.43) arrests for drug possession after release from prison ($F(3, 20976) = 30.09$, $p < .001$, $\eta^2 = .004$).

Table 5. Bivariate Analysis: Categories of Mental Illness and Recidivism

	Substance Use Disorder (*n* = 6,366)	Non-Substance Using Mental Illness (*n* = 2,721)	Co-Occurring Disorder (*n* = 2,083)	Without Mental Illness (*n* = 9,808)
New Arrest: Violent Crime	$\chi^2 = 22.5$, $df = 3$, $p < .001$, Cramer's $V = .03$, $p < .001$			
No	71.9%	74.1%	70.4%	69.8%
Yes	28.1%	25.9%	29.6%	30.2%
New Arrest: Property Crime	$\chi^2 = 44.33$, $df = 3$, $p < .001$, Cramer's $V = .05$, $p < .001$			
No	86.9%	84.7%	83.6%	88.1%
Yes	13.1%	15.3%	16.4%	11.9%
Return to Prison	$\chi^2 = 38.1$, $df = 3$, $p < .001$, Cramer's $V = .04$, $p < .001$			
No	52.1%	55.4%	49.7%	55.7%
Yes	47.9%	44.6%	50.3%	44.3%

Multivariate Analyses

Twelve logistic regressions were conducted to examine the relationship between the predictors of interest and the dichotomous outcomes: new arrest for a violent crime, new arrest for a property crime, and returning to prison. Next, four negative binomial regressions were conducted to examine the relationship between the predictors of interest and arrest for drug possession after release from prison. A negative binomial regression was used to predict the continuous outcome of new arrest for drug possession or sales for illicit drugs other than marijuana, which is the appropriate statistical tool for count data where the variance is twice that of the mean (Lawless, 1987). Prior recidivism studies have also used continuous outcome measure (Stalans & Lurigio, 2015).

For each outcome, comparisons were made across the mental health groups by conducting *z* tests for each significant predictor using the methods suggested by Brame,

Paternoster, Mazerolle, and Piquero (1998). Variables that were statistically significant predictors *within* all four mental health models were considered common predictors. Variables were considered unique predictors if statistically significant *within* one to three of the mental health models and if *z* scores revealed statistically significant differences in the coefficient's size. Presented here are the predictors that were both statistically significant *within* the mental health models ($p < .01$) and statistically different *across* the mental health models (i.e., a *z* score of 2.58 or larger).

New Arrest: Violent Crime

Commonalities across mental health categories. Looking across Table 6 and Table 7, four common predictors of violent recidivism for all mental health categories are revealed: prior arrest for a violent crime, age, type of history of violence. Individuals with a greater number of prior arrests for a violent crime and those who were younger when released from prison had an increased likelihood of being arrested for a new violent crime. As age at release increased, the likelihood of violent recidivism decreased by 7% for the non-MI group (*OR* = .93) and 6% for the SUD group (*OR* = .94), compared to 5% for the non-SUD MI group (*OR* = .95) and 4% for the COD group (*OR* = .96). Further analyses revealed age to be more strongly associated with violent recidivism for the non-MI group, compared to the non-SUD MI group ($z = 3.08$) and the COD group ($z = 4.50$). Age was also revealed to be more strongly associated with violent recidivism for the SUD group, compared to the COD group ($z = 3.88$).

Prior arrests for a violent crime was revealed to be a stronger predictor of violent recidivism for those with a COD, compared to those with a SUD ($z = 2.85$). Specifically, as the number of prior arrests for a violent crime increased, the likelihood of being arrested for a new violent crime increased by 6% for those with either a non-SUD MI or with a SUD only (*OR* =

1.06), 8% for those without MI (*OR* = 1.08), and 11% for COD (*OR* = 1.11). The history of specific types of violence also predicts the likelihood of being arrested for a new violent crime. Having no history of violence, relative to generalized aggressors, decreased the odds of being arrested by 86% to 89% across the four groups. Having a history of family only violence, relative to generalized aggressors, decreased the odds of being arrested for a new violent crime by 67% to 76% across the four groups. As indicated by the largest Wald statistic, the two strongest predictors of violent recidivism across the four mental health groups were age when released from prison and having no history of violence.

Across the four mental health categories, ten predictors were revealed to have no statistically significant relationship with violent recidivism. As seen in Table 6 and Table 7, having a current violent offense at admission to prison, a prior arrest for drug possession or a property crime, the number of prior incarcerations, prison disciplinary incidents, family history of incarceration, marital status, history of trauma, being Black, and the committing county were not significant predictors of violent recidivism.

Unique predictors for specific mental health categories. For individuals without a MI, there were four significant unique predictors of violent recidivism: serving the prison sentence for a property offense, length of time served, race, and education. Having a property crime at admission to prison increased the likelihood of a new arrest for a violent crime for those without a MI, but not for those with a non-SUD MI (z = -2.87) or COD (z = -3.24). Serving between 12 to 24 months in prison, relative to serving less than 12 months, decreased the likelihood of a new arrest for a violent crime for those without a MI, but not for those with a non-SUD MI (z = 3.64) or SUD (z = 2.74). Being Hispanic/other also decreased the likelihood of new arrest for a violent crime for those without a MI, but not for those with a COD (z = 3.81). Not having a high school

diploma or a GED decreased the likelihood of a new arrest for a violent crime, for those without a MI, but not for those with a non-SUD MI (z = -5.04) or COD (z = -5.38).

For those with a SUD only, being gang affiliated significantly predicted a new arrest for a violent crime. Being gang affiliated increased the likelihood of violent recidivism by 26% for those with a SUD (OR = 1.26), but did not significantly predict violent recidivism for those with a non-SUD MI (z = -3.94).

The total number of prior sentencing dates significantly predicted violent recidivism for individuals without a MI or with a SUD, but was not a significant predictor for individuals with a COD (z = -4.47). As the total number of prior sentencing dates increased, the likelihood of being arrested for a new violent crime increased by 2% for those without a MI or with a SUD (OR = 1.02).

Table 6. Non-Substance Using Mental Illness and Mental Illness with Co-Occurring Substance Use Disorder: Predicting Rearrest for Violent Crime

	Model 1: Non-Substance Using Mental Illness (n = 2,721)				Model 2: Mental Illness with Co-Occurring Substance Use Disorder (n = 2,083)			
Variable	*B*	*SE*	Wald	Exp(B)	*B*	*SE*	Wald	Exp(B)
Common Risk Factors								
Age at release	-.05	.01	66.89	.95**	-.05	.01	38.70	.96**
History of violence (generalized aggressors as reference)								
No history of violence	-2.13	.23	86.21	.12**	-1.97	.26	59.16	.14**
Family only	-1.14	.26	19.78	.32**	-1.11	.33	11.50	.33**
Prior arrests for violent crime	.06	.02	6.66	1.06*	.10	.03	16.83	1.11**
Unique Risk Factors								
Property offense on admission (drug crimes as reference)	.07	.13	.31	1.07	.05	.13	.13	1.05
Prior arrest for violating an order of protection	.48	.16	8.54	1.61*	.10	.18	.30	1.10
Total prior sentencing dates	.02	.01	5.22	1.02	.01	.01	1.28	1.01
Length of time served (<12 months as reference)			11.48	*			4.23	

12-24 months	-.01	.13	.00	.99	-.28	.14	3.76	.76
25 months plus	-.66	.20	10.78	.52**	-.27	.21	1.75	.76
History of nonfamily only (generalized aggressors as reference)	-.19	.12	2.46	.83	-.18	.13	1.92	.83
Gang affiliation (no = 0)	-.03	.14	.05	.97	.15	.14	1.29	1.17
Gender (female = 0)	.36	.12	8.65	1.44*	.54	.18	9.20	1.72*
Race: Hispanic/other (White as reference)	-.31	.22	2.01	.73	.17	.22	.57	1.18
Education (GED/HS diploma as reference)	-.02	.10	.03	.99	-.07	.11	.35	.94
Days at risk	.00	.00	7.03	1.00*	.00	.00	1.96	1.00
Common Non-Significant Risk Factors								
Violent offense on admission (drug crimes as reference)	-.07	.15	.21	.93	.25	.16	2.51	1.29
Prior arrests for drug possession	.00	.03	.00	1.00	-.01	.03	.23	.99
Prior arrests for property crime	.01	.07	.05	1.01	.18	.07	6.24	1.19
Number of incarcerations	.02	.05	.10	1.02	-.08	.05	2.39	.92
Disciplinary incidents (0 as reference)			5.60				1.73	
1-2	-.02	.12	.04	.98	.02	.13	.03	1.02
3-5	.28	.15	3.39	1.32	.17	.17	1.05	1.19
6 or more	.24	.17	2.12	1.28	.20	.19	1.10	1.22
Family members ever incarcerated IDOC (no = 0)	.00	.18	.00	1.00	.04	.23	.02	1.04
Marital status (married = 1)	.09	.13	.53	1.10	.20	.15	1.85	1.22
History of trauma (no = 0)	.04	.10	.13	1.04	.07	.11	.40	1.07
Race: Black (White as reference)	.04	.12	.10	1.04	.29	.14	4.49	1.34
Committing county (Cook County as reference)			.31				1.60	
Collar	-.06	.16	.12	.95	.07	.17	.16	1.07
Other urban	-.04	.14	.09	.96	.00	.15	.00	1.00
Rural	.03	.18	.03	1.03	.22	.21	1.19	1.25
Constant	.73	.36	4.08	2.07	.05	.43	.01	1.05
Pseudo-R^2 (Nagelkerke)	.23				.24			

Note. "Common Risk Factors" are statistically significant predictors across all four mental health groups. "Unique Risk Factors" are statistically significant predictors for one to three mental health groups. "Common Non-Significant Risk Factors" are non-significant predictors across the four mental health groups.
*$p < .01$, **$p < .001$

Table 7. Substance Use Disorder and Non-Mentally Ill: Predicting Rearrest for Violent Crime

	Model 3: Substance Use Disorder (n = 6,366)				Model 4: Non-Mentally Ill (n = 9,808)			
Variable	*B*	*SE*	Wald	Exp(B)	*B*	*SE*	Wald	Exp(B)
Common Risk Factors								
Age at release	-.07	.00	214.92	.94**	-.07	.00	377.47	.93**
History of violence (generalized aggressors as reference)								
No history of violence	-2.16	.15	202.55	.12**	-2.23	.12	325.43	.11**
Family only	-1.39	.19	53.55	.25**	-1.35	.15	81.37	.26**
Prior arrests for violent crime	.05	.02	12.18	1.06**	.08	.01	43.50	1.08**
Unique Risk Factors								
Property offense on admission (drug crimes as reference)	.11	.08	1.96	1.12	.28	.06	18.85	1.32**
Prior arrest for violating an order of protection	.39	.12	11.30	1.48**	.26	.10	6.89	1.29*
Total prior sentencing dates	.02	.01	8.34	1.02*	.02	.01	10.67	1.02**
Length of time served (<12 months as reference)			4.83				35.40	**
12-24 months	-.07	.08	.72	.94	-.28	.07	17.21	.76**
25 months plus	-.22	.10	4.82	.80	-.51	.10	27.64	.60**
History of violence: Nonfamily only (generalized aggressors as reference)	-.29	.08	14.67	.75**	-.18	.06	9.04	.83*
Gang affiliation (no = 0)	.23	.08	9.25	1.26*	.09	.06	1.94	1.09
Gender (female = 0)	.45	.22	4.14	1.56	.30	.12	5.98	1.35
Race: Hispanic/other (White as reference)	-.22	.12	3.15	.81	-.39	.10	14.78	.68**
Education (GED/HS diploma as reference)	.11	.07	2.64	1.11	.13	.05	6.75	1.14*
Days at risk	.00	.00	6.05	1.00	.00	.00	2.52	1.00
Common Non-Significant Risk Factors								
Violent offense on admission (drug crimes as reference)	.16	.09	3.60	1.17	.01	.07	.03	1.01
Prior arrests for drug possession	-.02	.01	1.81	.98	.00	.01	.11	1.00

Prior arrests for property crime	-.03	.04	.60	.97	.05	.04	2.05	1.05
Number of incarcerations	.01	.03	.06	1.01	.06	.03	4.50	1.06
Disciplinary incidents (0 as reference)			2.32				6.63	
1-2	.07	.08	.82	1.07	.01	.06	.03	1.01
3-5	.01	.10	.02	1.01	.02	.08	.04	1.02
6 or more	.14	.11	1.72	1.15	.23	.09	6.00	1.25
Family members ever incarcerated IDOC (no = 0)	.10	.15	.43	1.10	.20	.12	2.64	1.22
Marital status (married = 1)	.16	.09	3.24	1.18	.19	.07	6.32	1.21
History of trauma (no = 0)	.01	.14	.01	1.01	-.23	.13	2.87	.80
Race: Black (White as reference)	.09	.09	.96	1.09	.07	.07	.86	1.07
Committing county (Cook County as reference)			2.27				7.73	
Collar	.11	.10	1.33	1.12	.16	.08	4.27	1.17
Other urban	.11	.09	1.50	1.11	.16	.07	4.61	1.17
Rural	.02	.14	.03	1.02	-.01	.13	.01	.99
Constant	.77	.32	5.69	2.15	.54	.23	5.85	1.72
Pseudo-R^2 (Nagelkerke)	.23				.26			

Note. "Common Risk Factors" are statistically significant predictors across all four mental health groups. "Unique Risk Factors" are statistically significant predictors for one to three mental health groups. "Common Non-Significant Risk Factors" are non-significant predictors across the four mental health groups.
$^{*}p < .01$, $^{**}p < .001$

New Arrest: Property Crime

Commonalities across mental health categories. Across all four mental health groups, there were four characteristics that significantly predicted being arrested for a property crime after being released from prison. As shown in Table 8 and Table 9, having a conviction for a property crime as the admitting offense to prison, having prior arrests for a property crime, having fewer days at risk, and being younger when released from prison significantly predicted a new arrest for a property crime. Having a conviction for a property crime as the admitting offense to prison increased the likelihood of a new arrest for a property crime by 50% to 100% for the four groups. Having a prior arrest for a property crime increased the likelihood of a new arrest for a property crime by 36% to 164% for the four mental health groups. Each additional

day at risk decreased the odds of being arrested for a new property crime by 0.1% to 0.2% for the four groups. As indicated by the Wald statistic, the number of days at risk was the strongest predictor of a new property crime arrest for each mental health group. Age at release was found to be more strongly associated with being arrested for a new property crime for both the non-SUD MI and COD group, compared to the SUD and non-MI group, with all *z* scores greater than 2.58. Each additional year in age decreased the odds of being arrested for a new property crime by 3% for the non-SUD MI and COD group (*OR* = .97), compared to 2% for those without a MI (*OR* = .98), and 1% for those with a SUD (*OR* = .99).

Across the four mental health categories, there were 15 predictors that did not significantly predict being arrested for a property crime after being released from prison. As seen in Table 8 and Table 9, the following variables were not significant: overall length of time served, serving 12 to 24 months in prison, having a prior arrest for drug possession or violating an order of protection, prison disciplinary incidents, having no history of violence, history of family only or non-family only violence, gang affiliation, family history of incarceration, marital status, history of trauma, gender, being Black, education, and committing county.

Unique predictors for specific mental health categories. Four unique criminal history variables were found to be predictive of a new arrest for a property crime for one or two mental health group. For individuals with a non-SUD MI, having a violent offense at admission to prison decreased the likelihood of being arrested for a new property crime by 47% (*OR* = .53), but did not predict this recidivism for those with a SUD (*z* = -2.88). As the number of prior arrests for a violent crime increased, the likelihood of being arrested for a new property crime increased by 9% for people with a COD (*OR* = 1.09), but did not predict this recidivism for people with a non-SUD MI (*z* = -7.30), SUD (*z* = 5.96), or without a MI (*z* = 5.11). As the

number of incarcerations increased, the likelihood of being arrested for a new property crime increased by 5% for people with a SUD (*OR* = 1.05), but was not a significant predictor for those with a non-SUD MI (*z* = -5.97) or COD (*z* = -5.97).

Small but significant differences were also seen in the total number of prior sentencing dates predictor. A person's total number of prior sentencing dates was a significant predictor of being arrested for a property crime for those with a non-SUD MI or without a MI, but not for those with a COD or SUD, with all z-scores greater than 2.58. For people with a non-SUD MI, as the total number of prior sentencing dates increased, the odds of being arrested for a new property crime increased by 3% (*OR* = 1.03), compared to 2% for people without a MI (*OR* = 1.02).

Table 8. Non-Substance Using Mental Illness and Mental Illness with Co-Occurring Substance Use Disorder: Predicting Rearrest for Property Crime

	Model 5: Non-Substance Using Mental Illness (*n* = 2,721)				Model 6: Mental Illness with Co-Occurring Substance Use Disorder (*n* = 2,083)			
Variable	*B*	*SE*	Wald	Exp(B)	*B*	*SE*	Wald	Exp(B)
Common Risk Factors								
Days at risk	-.002	.00	93.64	.998**	-.001	.00	32.99	.999**
Age at release	-.03	.01	15.71	.97**	-.03	.01	10.64	.97**
Prior arrests for property crime	.31	.08	15.36	1.36**	.39	.08	22.79	1.48**
Property offense on admission (drug crimes as reference)	.53	.15	12.21	1.69**	.69	.16	18.97	2.00**
Unique Risk Factors								
Violent offense on admission (drug crimes as reference)	-.64	.21	9.22	.53*	-.18	.22	.62	.84
Prior arrests for violent crime	-.03	.03	1.33	.97	.09	.03	7.83	1.09*
Total prior sentencing dates	.03	.01	7.34	1.03*	.00	.01	.17	1.00
Number of incarcerations	-.01	.06	.03	.99	-.01	.06	.02	.99
Length of time served (<12 month as reference)			7.38				1.34	
12-24 months	-.05	.15	.09	.96	-.06	.17	.13	.94
25 months plus	-.67	.24	7.21	.52*	-.28	.25	1.34	.75
Race: Hispanic/other (White as reference)	-.13	.28	.22	.88	-.57	.33	2.97	.57

Common Non-Significant Risk Factors								
Prior arrests for drug possession	-.05	.03	2.63	.95	.002	.03	.01	1.00
Prior arrest for violating an order of protection	.11	.21	.28	1.12	.47	.21	4.92	1.59
Disciplinary incidents (0 as reference)			7.64				7.42	
1-2	-.05	.14	.13	.95	-.36	.16	4.79	.70
3-5	.03	.18	.04	1.03	-.05	.20	.07	.95
6 or more	.45	.19	5.68	1.57	.13	.22	.36	1.14
History of violence (generalized aggressors as reference)								
No history	-.54	.21	6.39	.58	.33	.24	1.89	1.40
Family only	-.13	.27	.23	.88	.24	.36	.44	1.27
Nonfamily only	-.32	.16	4.07	.73	.35	.17	4.30	1.42
Gang affiliation (no = 0)	-.28	.17	2.93	.75	.28	.16	2.98	1.32
Family members ever incarcerated in IDOC (no = 0)	.19	.21	.82	1.21	.21	.26	.66	1.24
Marital status (married = 1)	.10	.16	.39	1.10	-.04	.18	.05	.96
History of trauma (no = 0)	-.05	.12	.20	.95	-.03	.13	.04	.97
Gender (female = 0)	.05	.14	.10	1.05	.37	.22	2.90	1.44
Race: Black (White as reference)	.27	.14	3.57	1.30	.23	.16	1.99	1.26
Education (GED/HS diploma as reference)	-.28	.12	5.55	.76	-.14	.13	1.08	.87
Committing county (Cook County as reference)			3.68				2.37	
Collar	.17	.18	.84	1.18	.28	.20	1.88	1.32
Other urban	-.15	.16	.89	.86	.004	.18	.00	1.00
Rural	.08	.21	.14	1.08	.06	.25	.06	1.06
Constant	1.14	.42	7.35	3.12*	-.91	.51	3.21	.41
Pseudo-R^2 (Nagelkerke)	.17				.17			

Note. "Common Risk Factors" are statistically significant predictors across all four mental health groups. "Unique Risk Factors" are statistically significant predictors for one to three mental health groups. "Common Non-Significant Risk Factors" are non-significant predictors across the four mental health groups.
$^{*}p < .01$, $^{**}p < .001$

Table 9. Substance Use Disorder and Non-Mentally Ill: Predicting Rearrest for Property Crime

	Model 7: Substance Use Disorder (n = 6,366)				Model 8: Non-Mentally Ill (n = 9,808)			
Variable	*B*	*SE*	Wald	Exp(B)	*B*	*SE*	Wald	Exp(B)
Common Risk Factors								
Days at risk	-.002	.00	138.94	.998**	-.002	.00	192.37	.998**
Age at release	-.01	.01	6.64	.99**	-.02	.00	19.86	.98**
Prior arrests for property crime	.97	.10	97.55	2.64**	.78	.08	87.64	2.17**
Property offense on admission (drug crimes as reference)	.50	.05	92.84	1.64**	.40	.04	87.02	1.50**
Unique Risk Factors								
Violent offense on admission (drug crimes as reference)	.24	.13	3.35	1.27	.07	.10	.51	1.08
Prior arrests for violent crime	.00	.02	.02	1.00	.01	.02	.77	1.01
Total prior sentencing dates	.01	.01	.75	1.01	.02	.01	15.21	1.02**
Number of incarcerations	.05	.04	1.30	1.05**	.06	.03	3.25	1.06
Length of time served (<12 months as reference)			1.96				7.76	
12-24 months	.001	.10	.00	1.00	-.12	.09	1.93	.89
25 months plus	-.16	.13	1.60	.85	-.34	.13	7.33	.71*
Race: Hispanic/other (White as reference)	-.52	.17	9.90	.59*	-.48	.14	11.58	.62**
Common Non-Significant Risk Factors								
Prior arrests for drug possession	.03	.02	3.52	1.03	.01	.02	.10	1.01
Prior arrest for violating an order of protection	.34	.15	5.14	1.41	.17	.13	1.71	1.19
Disciplinary incidents (0 as reference)			2.16				5.85	
1-2	.13	.10	1.50	1.13	.15	.08	3.67	1.16
3-5	.11	.13	.68	1.11	.19	.10	3.44	1.21
6 or more	.18	.14	1.64	1.19	.20	.12	2.79	1.22
History of violence (generalized aggressors as reference)								
No history	-.05	.15	.12	.95	-.11	.13	.68	.90
Family only	-.40	.24	2.89	.67	-.23	.19	1.45	.80

Nonfamily only	.09	.10	.68	1.09	.06	.09	.49	1.06
Gang affiliation (no = 0)	-.03	.10	.09	.97	-.17	.08	4.12	.84
Family members ever incarcerated in IDOC (no = 0)	.13	.18	.56	1.14	.03	.16	.03	1.03
Marital status (married = 1)	-.03	.11	.05	.98	.07	.10	.49	1.07
History of trauma (no = 0)	-.11	.18	.35	.90	-.19	.16	1.34	.83
Gender (female = 0)	.18	.26	.51	1.20	-.35	.14	6.51	.70
Race: Black (White as reference)	-.08	.11	.61	.92	-.03	.09	.12	.97
Education (GED/HS diploma as reference)	-.01	.08	.01	.99	-.12	.07	3.01	.89
Committing county (Cook County as reference)			4.37				9.32	
Collar	-.17	.13	1.88	.84	-.09	.10	.81	.91
Other urban	-.18	.11	2.55	.83	-.24	.10	6.01	.79
Rural	-.29	.18	2.48	.75	-.40	.16	5.93	.67
Constant	-1.11	.39	8.31	.33*	-.49	.27	3.28	.61
Pseudo-R^2 (Nagelkerke)	.17				.14			

Note. "Common Risk Factors" are statistically significant predictors across all four mental health groups. "Unique Risk Factors" are statistically significant predictors for one to three mental health groups. "Common Non-Significant Risk Factors" are non-significant predictors across the four mental health groups.
$^{*}p < .01$, $^{**}p < .001$

Return to Prison

Commonalities across mental health categories. Three predictors significantly predicted being returned to prison across the four categories of mental health: having a greater number of incarcerations, being younger when released from prison, and having fewer days at risk. As seen in Table 10 and Table 11, as the number of incarcerations increased, the odds of returning to prison increased by 14% to 29% for all four mental health groups. As the number of days at risk increased, the odds of being returned to prison decreased by 1% for all categories of mental health (*OR* = .99). While age was a significant predictor within each mental health model, it was more strongly associated with returning to prison for the COD group, compared to the SUD group (z = -3.0) and non-MI group (z = -2.63). As age when released increased, the odds of returning to prison decreased by 5% for those with a COD (*OR* = .95), compared to 3% for those

with SUD or without a MI (*OR* = .97). As indicated by the Wald statistic, the strongest predictors of returning to prison were the number of days at risk and age when released from prison for the four categories of mental health.

Across the four mental health groups there were 12 predictors that did not significantly predict being returned to prison. As seen in Table 10 and Table 11, having a prior arrest for violating an order of protection, having one to two or three to five prison disciplinary incidents, having no history of violence, history of family only or nonfamily only violence, gang affiliation, family members with a history of incarceration, marital status, history of trauma, education, and committing county did not significantly predict being returned to prison after being released.

Unique predictors for specific mental health categories. Prior arrest for a violent crime and prior arrest for a property crime were significant predictors of returning to prison for one mental health group. For those with a COD, the likelihood of returning to prison increased by 9% as the number of prior arrests for a violent crime increased, but was not a predictor for the other three groups, with z-scores greater than 5.10. For those with a non-SUD MI, the likelihood of returning to prison increased by 16% with each additional prior arrest for a property crime, but this variable was not a significant predictor for individuals with a COD ($z = 3.29$), a SUD ($z = 3.30$), or without a MI ($z = 3.58$).

The following variables significantly predicted returning to prison for two or three mental health groups: race, prior arrest for drug possession, and total number of prior sentencing dates. Being Hispanic/other, relative to White, decreased the odds of returning to prison by 45% (*OR* = .55) for those without a MI and for those with a SUD, but was not a risk factor for those with a COD ($z = 3.41$, $z = 3.10$). A small, but statistically significant difference was also found in the strength of prior arrests for drug possession across two mental health groups. As the number of

prior arrests for drug possession increased, the likelihood of returning to prison increased by 7% for those without a MI (*OR* = 1.07), compared to 3% for those with a COD (*OR* = 1.03), (z = -4.59). Significant but small differences were also seen in the total number of prior sentencing dates across three mental health groups. As the number of total prior sentencing dates increased, the likelihood of returning to prison increased by 3% for those with a SUD or a non-SUD MI (*OR* = 1.03), compared to 2% for those without a MI (*OR* = 1.02), (*z* = 2.77).

Table 10. Non-Substance Using Mental Illness and Mental Illness with Co-Occurring Substance Use Disorder: Predicting Return to Prison

	Model 13: Non-Substance Using Mental Illness (*n* = 2,721)				Model 14: Mental Illness with Co-Occurring Substance Use Disorder (*n* = 2,083)			
Variable	*B*	*SE*	Wald	Exp(B)	*B*	*SE*	Wald	Exp(B)
Common Risk Factors								
Days at risk	-.01	.00	516.67	.99**	-.01	.00	407.54	.99**
Age at release	-.04	.01	32.45	.96**	-.05	.01	33.91	.95**
Number of incarcerations	.17	.06	8.35	1.18*	.25	.07	14.55	1.29**
Unique Risk Factors								
Violent offense on admission (drug crimes as reference)	.24	.18	1.86	1.27	.52	.21	6.21	1.67
Property offense on admission (drug crimes as reference)	.21	.15	2.11	1.24	.64	.16	15.68	1.89**
Prior arrests for drug possession	.06	.03	3.43	1.06	.03	.03	.98	1.03
Prior arrests for violent crime	-.03	.03	1.12	.97	.09	.03	6.96	1.09*
Prior arrests for property crime	.15	.08	3.51	1.16*	.01	.09	.00	1.01
Total prior sentencing dates	.03	.01	10.64	1.03**	-.01	.01	.23	1.00
Length of time served (<12 months as reference)			15.70	**			3.04	
12-24 months	-.47	.16	8.15	.63*	-.26	.18	2.07	.77
25 months plus	-.80	.24	11.32	.45**	-.39	.28	1.96	.68
Disciplinary incidents (0 as reference)			5.03				4.95	

1-2	-.04	.14	.07	.97	-.19	.16	1.53	.82
3-5	-.22	.19	1.38	.81	-.27	.22	1.49	.76
6 or more	.28	.20	1.95	1.33	.21	.25	.72	1.24
Gender (female = 0)	-.05	.14	.15	.95	.45	.19	5.79	1.57
Race (White as reference)								
Hispanic/other	-.37	.24	2.38	.69	.17	.29	.33	1.18
Black	.12	.14	.72	1.13	.58	.17	10.97	1.78**
Common Non-Significant Risk Factors								
Prior arrest for violating an order of protection	.24	.22	1.26	1.27	.12	.24	.25	1.13
History of violence (generalized aggressors as reference)								
No history	-.25	.22	1.31	.78	-.06	.25	.06	.94
Family only	-.38	.27	2.07	.68	-.34	.34	.96	.72
Nonfamily only	-.09	.16	.29	.92	.01	.19	.00	1.01
Gang affiliation (no = 0)	.10	.17	.33	1.10	-.15	.19	.64	.86
Family members ever incarcerated in IDOC (no = 0)	.20	.20	1.00	1.22	.20	.27	.52	1.22
Marital status (married = 1)	.18	.15	1.37	1.19	.10	.18	.28	1.10
History of trauma (no = 0)	-.21	.12	3.02	.81	.16	.14	1.27	1.17
Education (GED/HS diploma as reference)	.16	.12	1.84	1.17	.03	.14	.05	1.03
Committing county (Cook County as reference)			6.66				1.94	
Collar	-.29	.19	2.40	.75	.20	.22	.84	1.23
Other urban	-.12	.16	.56	.89	-.10	.20	.23	.91
Rural	-.51	.21	5.64	.60	.03	.26	.01	1.03
Constant	13.38	.71	357.18	647359**	13.76	.83	275.97	947664**
Pseudo-R^2 (Nagelkerke)	.63				.66			

Note. "Common Risk Factors" are statistically significant predictors across all four mental health groups. "Unique Risk Factors" are statistically significant predictors for one to three mental health groups. "Common Non-Significant Risk Factors" are non-significant predictors across the four mental health groups.
*$p < .01$, **$p < .001$

Table 11. Substance Use Disorder and Non-Mentally Ill: Predicting Return to Prison

	Model 15: Substance Use Disorder (n = 6,366)				Model 16: Non-Mentally Ill (n = 9,808)			
Variable	*B*	*SE*	Wald	Exp(B)	*B*	*SE*	Wald	Exp(B)
Common Risk Factors								
Days at risk	-.01	.00	1257.1	.99**	-.01	.00	1905.1	.99**
Age at release	-.03	.01	50.93	.97**	-.04	.00	99.99	.97**
Number of incarcerations	.13	.04	11.23	1.14**	.17	.03	30.07	1.19**
Unique Risk Factors								
Violent offense on admission (drug crimes as reference)	.21	.11	3.74	1.24	.25	.08	8.46	1.28*
Property offense on admission (drug crimes as reference)	.42	.09	20.33	1.52**	.49	.08	42.54	1.63**
Prior arrests for drug possession	.05	.02	7.52	1.05*	.07	.01	25.98	1.07**
Prior arrests for violent crime	.01	.02	.19	1.01	.00	.02	.01	1.00
Prior arrests for property crime	.01	.05	.03	1.01	.00	.04	.002	1.00
Total prior sentencing dates	.03	.01	15.55	1.03**	.02	.01	15.58	1.02**
Length of time served (<12 months as reference)			8.55				29.53	**
12-24 months	-.06	.10	.38	.94	-.33	.08	16.24	.72**
25 months plus	-.37	.13	8.25	.69*	-.54	.12	21.05	.58**
Disciplinary incidents (0 as reference)			11.56	*			20.61	**
1-2	.03	.09	.08	1.03	.11	.07	2.51	1.11
3-5	-.11	.12	.74	.90	.14	.10	2.15	1.16
6 or more	.35	.14	6.51	1.42	.54	.12	20.51	1.72**
Gender (female = 0)	.72	.20	12.84	2.05**	.16	.12	1.65	1.17
Race (White as reference)								
Hispanic/other	-.61	.15	17.01	.55**	-.60	.12	26.12	.55**
Black	.11	.10	1.10	1.12	.22	.09	6.40	1.24
Common Non-Significant Risk Factors								

Prior arrest for violating an order of protection	-.11	.15	.47	.90	.10	.13	.66	1.11
History of violence (generalized aggressors as reference)								
No history	-.31	.14	4.66	.74	-.17	.11	2.18	.85
Family only	.01	.18	.01	1.01	-.07	.15	.24	.93
Nonfamily only	-.12	.10	1.38	.89	.09	.08	1.32	1.10
Gang affiliation (no = 0)	.23	.09	6.11	1.26	.12	.08	2.39	1.13
Family members ever incarcerated in IDOC (no = 0)	-.10	.19	.28	.91	-.07	.15	.23	.93
Marital status (married = 1)	.19	.11	3.18	1.21	.09	.08	1.07	1.09
History of trauma (no = 0)	.05	.16	.09	1.05	.03	.14	.04	1.03
Education (GED/HS diploma as reference)	.08	.08	.97	1.08	.15	.06	6.12	1.16
Committing county (Cook County as reference)			4.39				7.41	
Collar	-.12	.12	.97	.89	-.05	.09	.33	.95
Other urban	-.15	.11	1.81	.87	-.21	.09	5.67	.81
Rural	-.32	.17	3.76	.73	-.27	.14	3.69	.76
Constant	12.66	.49	666.03	315953**	12.07	.37	1084.23	174589**
Pseudo-R^2 (Nagelkerke)	.65				.62			

Note. "Common Risk Factors" are statistically significant predictors across all four mental health groups. "Unique Risk Factors" are statistically significant predictors for one to three mental health groups. "Common Non-Significant Risk Factors" are non-significant predictors across the four mental health groups.
$^{*}p < .01$, $^{**}p < .001$

New Arrest: Drug Possession

Commonalities across mental health categories. Across the four categories of mental health, there were 11 predictors that did not significantly predict being arrested for drug possession after being released from prison. As seen in Table 12 and Table 13, having a prior arrest for a violent crime or for violating an order of protection, the number of incarcerations,

having no history of violence, history of family only violence, history of nonfamily only violence, gang affiliation, family incarceration history, marital status, history of trauma, and education did not significantly predict a new arrest for drug possession.

There were two characteristics that were predictive of being arrested for drug possession after release from prison across the four categories of mental health. As seen in Table 12 and Table 13, prior arrest for drug possession and age were significant predictors of being arrested for drug possession after release. As the number of prior arrests for drug possession increased, the odds of being arrested for drug possession after release increased by 16% for the non-SUD MI group (*OR* = 1.16), 15% for the COD group, and 13% for the SUD and without a MI group (*OR* = 1.13). For those with a non-SUD MI, the strongest predictor of a new arrest for drug possession was having a prior arrest for drug possession. For those with a COD, SUD, or without a MI, age when released from prison was one of the strongest predictors of a new arrest for drug possession. Further analysis revealed that age was more strongly associated with this recidivism for those with a SUD ($z = 3.6$) or without a MI ($z = 3.26$), than for those with a non-SUD MI. As age when released from prison increased, the odds of having a new arrest for drug possession decreased by 3% for the non-SUD MI group, compared to 5% for the SUD group (*OR* = .95) and 4% for the COD and non-MI group (*OR* = .96).

Unique predictors for specific mental health categories. For individuals without a MI, there were four significant unique predictors of a new arrest for drug possession: gender, race, being convicted to prison in a collar county, and number of disciplinary incidents while incarcerated. As shown in Table 13, the three categories of number of prison disciplinary incidents, relative to zero, increased the likelihood of a new arrest for drug possession for people without a MI, but not for individuals with a non-SUD MI for one to two incidents ($z = -5.25$), or

the SUD group for three to five incidents (z = -5.05). Having six or more prison disciplinary incidents also increased the likelihood of a new arrest for drug possession for people without a MI, but not for people with a non-SUD MI (z = -4.57). As the number of prison disciplinary incidents increased for people without a MI, the likelihood of being arrested for drug possession increased, 11% for one to two disciplinary incidents (*OR* = 1.11), 15% for three to five disciplinary incidents (*OR* = 1.15), and 32% for six or more disciplinary incidents (*OR* = 1.32). For people without a MI, the odds of males being arrested for drug possession was 57% higher than for females (*OR* = 1.57), but gender was not a predictor for those with a non-SUD MI (z = -3.29), COD (z = -4.39), or SUD (z = -2.85). Being Hispanic/other, relative to White, decreased the odds of a new arrest for drug possession by 32% for those without a MI (*OR* = .68), but was this was not a risk factor for those with a non-SUD MI (z = 2.99). Being committed to prison from a collar county, relative to Cook County, decreased the likelihood of being arrested for drug possession for people without a MI, but not for those with a non-SUD MI (z = 4.66).

Having a prior arrest for property crime was one unique predictor of being arrested for drug possession after release from prison for people with a COD. Having a prior arrest for a property crime increased the likelihood of being arrested for a new drug possession by 14% for people with a COD (*OR* = 1.14), but not for people with a SUD (z = 2.64) or without a MI (z = 3.77).

Total number of prior sentencing dates was a significant predictor of being arrested for drug possession after release from prison for those with a non-SUD MI or a SUD, but not for those with a COD or without a MI, with all z scores greater than 2.58. As the total number of prior sentencing dates increased, the likelihood of being arrested for drug possession increased

by 2% for those with a non-SUD MI or a SUD (*OR* = 1.02), compared to 1% for those without a MI (*OR* = 1.01).

Table 12. Non-Substance Using Mental Illness and Mental Illness with Co-Occurring Substance Use Disorder: Predicting Rearrest for Drug Possession

	Model 9: Non-Substance Using Mental Illness (*n* = 2,721)				Model 10: Mental Illness with Co-Occurring Substance Use Disorder (*n* = 2,083)			
Variable	*B*	*SE*	Wald	Exp(B)	*B*	*SE*	Wald	Exp(B)
Common Risk Factors								
Prior arrests for drug possession	.15	.02	90.77	1.16**	.14	.02	78.08	1.15**
Age at release	-.04	.00	70.89	.97**	-.04	.01	82.28	.96**
Unique Risk Factors								
Offense on admission (drug crimes as reference)								
Violent	-.48	.11	20.34	.62**	-.11	.12	.95	.89
Property	-.34	.08	16.81	.71**	-.19	.09	4.80	.83
Prior arrests for property crime	.09	.05	3.19	1.09	.13	.05	7.00	1.14*
Total prior sentencing dates	.02	.01	7.12	1.02*	.01	.01	4.33	1.01
Length of time served (<12 months as reference)								
12-24 months	-.16	.10	2.74	.86	-.14	.10	1.87	.87
25 months plus	-.16	.13	1.40	.86	-.20	.15	1.79	.82
Disciplinary incidents (0 as reference)								
1-2	-.16	.08	3.65	.85	.06	.09	.39	1.06
3-5	.15	.10	2.09	1.16	.11	.12	.80	1.11
6 or more	-.04	.12	.09	.97	.24	.13	3.47	1.28
Gender (female = 0)	.03	.08	.10	1.03	-.15	.11	1.91	.87
Race (White as reference)								
Hispanic/other	-.07	.16	.19	.93	-.40	.18	5.40	.67
Black	.22	.09	6.67	1.25*	.19	.10	4.10	1.21
Committing county (Cook County as reference)								
Collar	.01	.11	.01	1.01	-.20	.12	2.87	.82
Other urban	-.16	.10	2.61	.86	-.38	.11	11.95	.69**
Rural	-.25	.14	3.34	.78	-.05	.14	.14	.95
Days at risk	.00	.00	6.22	1.00	.00	.00	2.56	1.00
Common Non-Significant Risk Factors								
Prior arrests for violent crime	-.01	.02	.25	.99	.00	.02	.00	1.00

Prior arrest for violating an order of protection	-.05	.13	.13	.95	-.03	.14	.06	.97
Number of incarcerations	.08	.03	5.23	1.08	.07	.04	3.69	1.07
History of violence (generalized aggressors as reference)								
No history	-.30	.13	5.56	.74	-.08	.14	.36	.92
Family only	-.43	.19	5.15	.65	.21	.20	1.16	1.23
Nonfamily only	.04	.09	.16	1.04	.22	.10	4.86	1.24
Gang affiliation (no = 0)	-.12	.09	1.57	.89	.01	.09	.00	1.01
Family members ever incarcerated in IDOC (no = 0)	.13	.12	1.05	1.14	-.06	.15	.15	.94
Marital status (married = 1)	.21	.10	4.51	1.23	.01	.10	.01	1.01
History of trauma (no = 0)	-.09	.07	1.70	.91	-.05	.07	.37	.96
Education (GED/HS diploma as reference)	-.03	.07	.14	.98	-.09	.07	1.55	.91
Intercept	.56	.27	4.16	1.74	.86	.31	7.75	2.35*

Note. "Common Risk Factors" are statistically significant predictors across all four mental health groups. "Unique Risk Factors" are statistically significant predictors for one to three mental health groups. "Common Non-Significant Risk Factors" are non-significant predictors across the four mental health groups.
*$p < .01$, **$p < .001$

Table 13. Substance Use Disorder and Non-Mentally Ill: Predicting Rearrest for Drug Possession

	Model 11: Substance Use Disorder (n = 6,366)				Model 12: Non-Mentally Ill (n = 9,808)			
Variable	*B*	*SE*	Wald	Exp(B)	*B*	*SE*	Wald	Exp(B)
Common Risk Factors								
Prior arrests for drug possession	.12	.01	202.55	1.13**	.12	.01	272.59	1.13**
Age at release	-.05	.00	307.98	.95**	-.05	.00	443.24	.96**
Unique Risk Factors								
Offense on admission (drug crimes as reference)								
Violent	-.23	.06	15.99	.79**	-.27	.05	36.04	.76**
Property	-.27	.05	28.37	.76**	-.19	.04	20.23	.83**
Length of time served (<12 months as reference)								
12-24 months	-.11	.05	4.78	.89	-.17	.04	15.88	.84**
25 months plus	-.24	.07	13.04	.79**	-.34	.06	28.63	.72**
Prior arrests for property crime	.05	.03	2.61	1.05	.02	.02	.56	1.02
Total prior sentencing dates	.02	.00	20.79	1.02**	.01	.00	17.82	1.01**
Disciplinary incidents (0 as reference)								

1-2	.07	.05	1.77	1.07	.10	.04	7.14	1.11*
3-5	-.02	.06	.14	.98	.14	.05	7.71	1.15*
6 or more	.10	.07	2.05	1.10	.28	.06	21.82	1.32**
Gender (female = 0)	.08	.11	.47	1.08	.45	.08	32.55	1.57**
Race (White as reference)								
Hispanic/other	-.33	.09	14.02	.72**	-.39	.07	28.02	.68**
Black	.36	.06	35.52	1.43**	.38	.05	51.81	1.46**
Committing county (Cook County as reference)								
Collar	-.11	.06	3.03	.90	-.23	.05	19.26	.79**
Other urban	-.27	.06	20.38	.76**	-.20	.05	15.25	.82**
Rural	-.26	.10	7.60	.77*	-.21	.09	6.11	.81
Days at risk	.00	7.65	22.20	1.00**	.00	6.31	37.94	.96**
Common Non-Significant Risk Factors								
Prior arrests for violent crime	.01	.01	.72	1.01	.01	.01	2.65	1.01
Prior arrest for violating an order of protection	-.08	.09	.83	.92	-.11	.08	2.19	.90
Number of incarcerations	.02	.02	.65	1.02	.03	.02	4.00	1.04
History of violence (generalized aggressors as reference)								
No history	.01	.08	.00	1.01	-.10	.06	2.36	.91
Family only	.00	.11	.00	1.00	-.06	.09	.53	.94
Nonfamily only	.07	.05	2.04	1.08	.08	.04	3.45	1.08
Gang affiliation (no = 0)	.03	.05	.36	1.03	-.07	.04	3.05	.93
Family members ever incarcerated in IDOC (no = 0)	-.18	.10	3.53	.84	.02	.08	.07	1.02
Marital status (married = 1)	.11	.06	3.19	1.11	.11	.05	5.45	1.12
History of trauma (no = 0)	.03	.09	.15	1.04	-.07	.09	.59	.93
Education (GED/HS diploma as reference)	-.03	.04	.35	.98	.06	.03	3.29	1.06
Intercept	.92	.20	21.82	2.50**	.46	.15	9.01	1.58*

Note. "Common Risk Factors" are statistically significant predictors across all four mental health groups. "Unique Risk Factors" are statistically significant predictors for one to three mental health groups. "Common Non-Significant Risk Factors" are non-significant predictors across the four mental health groups.
*$p < .01$, **$p < .001$

CHAPTER FOUR

DISCUSSION

This study merges the risk assessment field for individuals without mental illness and for individuals with mental illness. Much research has focused on samples of only persons with mental illness (Alia-Klein et al., 2007; Elbogen & Johnson, 2009; Large & Nielssen, 2011; Monahan et al., 2000; Skeem et al., 2016; Steadman et al., 1998; Swanson et al., 1997) or on samples of offenders (Bonta et al., 2014; Bonta et al., 1998; Becker et al., 2011; Ferguson et al., 2009; Junginger et al., 2006; Kingston et al., 2016; Lovell et al., 2002; Peterson et al., 2010; Peterson et al., 2014; Reich et al., 2015; Skeem et al., 2014). Research on samples drawn from probation or prison (Andrews & Bonta, 2010; Andrews et al., 2006; Caudy et al., 2013; Degiorgio & DiDonato, 2014; Gendreau et al., 1996; Ireland & Windom, 1994; Langan & Levin, 2002; Lipsey & Wilson, 1998; Mead et al., 2012; Olson et al., 2004; Rezansoff et al., 2013; Singh & Fazel, 2010; Stahler et al., 2013; Stalans et al., 2004; Widom, 1989) has not examined whether mental illness modifies which background characteristics serve as risk factors for recidivism. Moreover, prior studies have not extensively examined offenders with COD and how risk factors differ for those with a COD, compared to those with a non-SUD MI, SUD, or non-MI. The current study found that across the four types of recidivism, fewer risk factors predicted recidivism for those with a COD compared to those without mental illness; however, two of the common risk factors, age at release and number of prior arrests for violent crime, had stronger predictive validity for the COD group.

Confirming much prior research (Bonta et al., 1998; Gendreau et al., 1996; Håkansson & Berglund, 2012; Jaffe et al., 2012; Lam, 2014; Langan & Levin, 2002; Lovell et al., 2002; Messina et al., 2004; Phillips et al., 2005; Rezansoff et al., 2013; Stahler et al., 2013), age when released from prison consistently predicted violent, property, and drug possession recidivism and return to prison decisions across the mental health groups. Despite prior studies finding age to predict future crime, the RNR model does not identify age as one of the central-right risk/needs factors, but it is identified as a factor in the specific responsivity principle (Andrews & Bonta, 2010). Moreover, age when released from prison was more strongly associated with being arrested for a property crime and returning to prison for those with a COD than it was for those without a COD.

Across the four mental health groups, prior arrests for specific types of crime were predictive of recidivism for that type of crime. Having a prior arrest for a violent crime predicted violent recidivism, prior property arrest predicted having property recidivism, and prior drug possession arrest predicted drug possession recidivism. These findings are consistent with prior research that has found having a greater number of arrests, prior arrests for a violent crime, and nonviolent criminal history to predict general and violent recidivism (Bonta et al., 1998; Degiorgio & DiDonato, 2014; Lovell et al., 2002). However, these findings are inconsistent with prior research that found prior drug charges to be negatively associated with general recidivism (Dowden & Brown, 2002). Having a greater number of prior offenses is a risk factor within the antisocial behavior domain of the central eight risk/need factors (Andrews & Bonta, 2010). The specific type of crime is not included as a predictor of that type of crime, though. The number of

prior arrests for violent crime was more strongly associated with violent recidivism for the COD group.

For all groups, individuals with no history of violence or only a history of violence toward family members compared to generalized aggressors were less likely to have a new arrest for a violent crime. This is consistent with prior research, individuals identified as a generalized aggressor (i.e., violent towards friends, family, acquaintances, and strangers), compared to those with no history of violence or a history of family only violence, were at an increased likelihood of being arrested for a new violent crime after release from probation (Stalans et al., 2004). Within the SUD and non-MI models, having a history of nonfamily violence (relative to generalized aggressors) was predictive of violent recidivism, but the z-scores did not indicate that this measure was a unique risk factor for only these two groups.

Unique Risk Factors Across Mental Health Groups

The greatest number of significant predictors of new arrest for a violent crime, new arrest for drug possession, and return to prison were found for those without a MI. This is inconsistent with the findings from Bonta et al. (1998) meta-analysis, which found that the number of significant predictors of recidivism for offenders with a MI compared to offenders without a MI was "almost identical" (p. 135). The number of significant differences compared to the number of conducted tests suggests that these findings are real and do not capitalize on chance. For each outcome, comparisons were made across the mental health groups by conducting *z* tests for each significant predictor. There were 14 significant predictors for a new arrest for a violent crime and for return to prison, and 13 significant predictors of drug possession. The number of comparisons for those without a MI to the three MI groups was 123, and one difference would be

expected by chance at the alpha level of .01. For violent recidivism 8 of the 14 predictors showed real differences across the four groups (*z* scores greater or equal to 2.58), and seven of these were more strongly related to violent recidivism for the non-MI group. For returning to prison, 9 predictors showed significant differences across the four mental health groups, and three of these predictors were more strongly associated for the non-MI group. Seven of the thirteen significant risk factors were more predictive of drug possession recidivism for the non-MI group than for the other groups.

Unlike the other three outcomes, the greatest number of risk factors for new arrest for property crime were found for those with a non-SUD MI. There were 10 significant risk factors for new arrest for a property crime across the four mental health groups. Of these significant predictors, 5 predictors of a new arrest for a property crime had significant differences across the four groups (*z* scores greater than 2.58). There were 3 risk factors that were strongly associated with a new property crime arrest for the non-SUD MI group, 2 for the COD group, 1 for the SUD group, and 2 for the non-MI group. Across the four outcomes, the lowest number of unique risk factors were found for felony property recidivism.

Unique risk factors revealed patterns across the four groups for current offense, total prior sentencing dates, number of incarcerations, and race. Current offense on admission to prison (i.e., violent, property, drug crimes) did not consistently predict a repeat crime of that type. Being admitted to prison for a property conviction predicted property recidivism across the mental health groups, and violent recidivism for the non-MI group. This predictor was previously found to predict property crime recidivism for those without a mental illness (Langan & Levin, 2002). Unlike findings from prior research (Bonta et al., 1998), having a conviction for

a violent crime as the admitting offense to prison did not predict violent recidivism for any of the mental health groups. However, conviction for violent offense for admission to prison did predict property crime recidivism for those with a non-SUD MI.

The total number of prior sentencing dates has been a consistent predictor of violent recidivism in previous studies and is used in specific risk assessment tools for both sex offenders and violent recidivism such as the SACJ, Static-99, and Static-2002 (Grubin, 1998; Hanson & Thorton, 1999; Helmus & Thorton, 2015). It, however, did not predict recidivism for those with COD, but predicted all forms of recidivism for those without MI. For the remaining two groups with non-SUD MI and the SUD group, total number of prior sentencing dates significantly predicted return to prison and new arrest for drug possession, and predicted violent recidivism for the SUD group and property recidivism for the non-SUD MI.

The number of prior incarcerations has been used in specific risk assessment, such as the SFS and COMPAS, to predict return to prison and new arrests for: any offense, a felony, or a person crime (Brennan & Oliver, 2000; Hoffman, 1994). The number of prior incarcerations significantly predicted returning to prison for all mental health groups and predicted new arrest for property crime for the SUD group. Prior research has found that those with a COD had a greater number of prior incarcerations compared to non-SUD MI and non-MI (Baillargeon et al., 2010; Ogloff et al., 2015). Comparisons of mentally ill offenders and non-mentally ill offenders has also found mentally ill offenders to have a greater number of prior incarcerations than non-mentally ill offenders (Baillargeon et al., 2009). However, these differences were not found in the current study.

An interesting pattern emerged with race across the four types of recidivism. Previous research has not found race to predict reincarceration for offenders with a SUD or COD (Kelly & Welsh, 2008; Messina et al., 2004). However, the current study found those in the SUD and non-MI group who were White (relative to Hispanic/other) were at an increased likelihood of returning to prison. Those in the non-MI group who were White (relative to Hispanic/other) were also at an increased likelihood of being arrested for a violent crime after release compared to the COD group and being arrested for drug possession after release compared to the non-SUD MI group. Prior research has primarily compared Whites to all ethnic minorities as a group or Blacks to Whites, and found minorities to have a greater risk of general recidivism (Gendreau et al., 1996) and violent recidivism (Bonta et al., 1998; Lam, 2014; Langan & Levin, 2002; Stalans et al., 2004). The current study extends this prior research through specific ethnic comparisons of Black and Hispanic to White, and found that Whites compared to Hispanics have higher rates of drug possession recidivism and returns to prison.

Gang affiliation was used to measure anti-social companions, which is a theoretically relevant predictor in the RNR model (Andrews & Bonta, 2010). Prior research on offenders without a MI has found that having antisocial associates or companions predicted recidivism (Andrews & Bonta, 2010; Gendreau et al., 1996; Caudy et al., 2013; Olson et al., 2004). However, gang affiliation was not predictive of any form of recidivism in the current study for those without a MI. Prior research has also found offenders with a substance use disorder to have more anti-social companions compared to offenders with a mental illness only (Ferguson et al., 2009). For individuals with a SUD in this study, being gang affiliated was predictive of violent recidivism.

Limitations and Future Research

There were three variables that did not predict any type of recidivism across the mental health groups. Inconsistent with prior research, having a family history of incarceration and marital status did not predict any type of recidivism (Andrews & Bonta, 2010; Bonta et al., 1998; Bonta et al., 2014; Elbogen & Johnson, 2009; Gendreau et al., 1996; Monahan et al., 2001). Within the RNR framework, the family/marital domain has been identified as one of the moderate four risk factors of recidivism (Andrews & Bonta, 2010). Within the marital domain, having a spouse with neutral or procriminal expectations and an overall poor-quality relationship serve as risk factors for recidivism (Andrews & Bonta, 2010). The current study only accounted for marital status, not the quality of a person's relationship or their spouse's attitude towards crime. This is information not routinely assessed during prison intake.

There have been mixed findings about whether previous victimization or experiences of traumatic events is associated with higher rates of recidivism (Andrews & Bonta, 1995; Elbogen & Johnson, 2009; Ireland & Widom, 1994; Lam, 2014; Monahan et al., 2001; Van Dorn et al., 2012; Widom, 1989). The measure of trauma history, however, did not predict any type of recidivism for any of the mental health groups. This lack of significance in the current study could be due to the reliance on self-report. The prevalence of prior trauma (i.e., physical abuse, sexual abuse, intimate-partner violence) may be underestimated because inmates may be unwilling to disclose this personal history to correctional staff. Additionally, having a history of trauma may not be a conceptually relevant predictor of recidivism, an argument consistent with the RNR framework.

The current study has several limitations that should be considered when considering the generalizability of the findings. The data used in this study is data IDOC routinely collects during the admission process (Olson et al., 2016, p. 20). During the intake process inmates are screened for substance abuse disorders with the TCU Drug Screen II which is a valid and reliable measure of SUD (Knight et al., 2002). Prior research has used the TCU Drug Screen II in prison populations and found this measure to have "high positive predictive values and sensitivity, indicating that they are highly accurate in identifying substance-dependent participants (i.e., false positives)" (Baillargeon et al., 2010, p. 369). In the current study, inmates in the SUD group were identified using this measure, which increases the construct validity of classifying individuals as having a SUD disorder. However, there are also limitations to the reliance on the data routinely collected by IDOC. During the intake process in place at the time of the study, offenders' mental illness was not assessed by a clinician in a format that was accessible for the research. Therefore, individuals with a non-SUD MI had to be identified from reported symptoms and behaviors related to mental illness and not on clinical diagnosis. It would be beneficial if IDOC conducted clinical assessments on offenders who indicate having a history of mental illness (Olson et al., 2016). This would allow for offender's mental illness to be more readily identified and potentially allow them to receive needed treatment during their incarceration. Having clinical diagnoses available also would bridge the two fields of risk assessments, as research collected on general offender samples released from prison generally uses self-reported symptoms and research collected on samples of mentally ill persons generally uses clinical diagnoses.

Another limitation, due to the secondary data analysis, was the inability to rule out certain extraneous variables. Several theoretically relevant variables within the central-eight risk/needs factors were unable to be included in the analyses because this information is not routinely collected by IDOC in a form that was accessible for the research. The current study was unable to include the following theoretically relevant variables: arrest history during adolescence (antisocial behavior); early onset of criminal behavior, criminal attitude, anger problems (antisocial personality pattern); beliefs about crime and attitudes about the law and justice system (antisocial cognitions); level of involvement, reward, and satisfaction with school or work, quality of relationships within school or work settings (school/work); involvement in noncriminal activities (leisure/recreation); and the degree to which the needs of those with mental illness and/or substance use disorder were treated while incarcerated. Although available in the data, there were two history of treatment variables that could not be included in the analysis. Having a prior history of treatment could not be included as a predictor due to multicollinearity between past treatment for mental illness and current mental illness ($r(21893) = .79, p < .001$). History of substance abuse treatment was also not included in the analysis due to missing data.

The current study shows that while the four groups of offenders share some risk factors, there are many risk factors that differ across the four mental health groups. Further research is needed to identify the specific risk factors that predict recidivism for the subgroup with co-occurring disorders. In the current study, having a prior arrest for a violent crime was a risk factor for violent recidivism, property recidivism and returning to prison for those with COD. Future research should examine if prior arrests for specific types of violent crime predict the

recidivism of individuals with co-occurring disorders. Future research might also address the limitations of the current study. For instance, the theoretically relevant risk factors that were not measured in the current study, should be included in future studies comparing these specific subgroups of mentally ill and non-mentally ill offenders. Exploring how the theoretically relevant risk factors differ across these four groups might reveal more differences or similarities than the current study.

Theoretical and Practical Implications

The theory of the psychiatric model that offenders with mental illness are more likely to engage in violence and criminal behavior than offenders without a mental illness (Cloyes et al., 2010) was not supported in the bivariate analysis in the current study. There were no significant differences between the four mental health groups and their rate of violent recidivism, property crime recidivism, or return to prison. This is consistent with prior research that found no significant differences in the rates of recidivism (general, violent, return to prison) of offenders with a mental illness compared to non-mentally disordered offenders (Skeem et al., 2014). There were small differences in recidivism for new arrest for drug possession, with the non-SUD MI group having a slightly less mean number of arrests after release from prison.

The findings of the current study suggest that across the four measures of recidivism, the non-SUD MI, COD, SUD, and non-MI groups all shared few significant risk factors. While some risk factors were significant for one to three of the groups, fewer were significant for all four groups. General offender populations have been the most extensively studied in the risk assessment literature. Therefore, more is known about the risk factors that are theoretically relevant for general offender populations, but these may not be significant predictors when

breaking offender populations into non-SUD MI, COD, SUD, and non-MI groups. In the current study, the greatest number of significant risk factors were found for those without a MI. This suggests that less is understood about what predicts recidivism for those with a non-SUD MI, COD, or SUD. Offenders with a non-SUD MI, COD, or SUD may possess different social or personal factors than offenders without a MI that were not measured in the current study. Further research is needed to identify what does predict recidivism for these groups.

Prior studies have found that criminal history variables are the strongest predictors of recidivism for offenders with and without mental illness (Andrews & Bonta, 2010; Bonta et al., 1998; Caudy et al., 2013; Gendreau et al., 1996; Jaffe et al., 2012; Kelly & Welsh, 2008). The current study found that majority of the significant risk factors were criminal history variables. According to Andrews and Bonta (2010), having a more extensive criminal history indicates a person has "a history of decision making supportive of crime" and engaging in criminal activity may be more natural for those with these extensive histories (p. 226). The criminal history variables are static risk factors, which cannot be directly targeted in treatment because you cannot change someone's criminal history (McCormick et al., 2015). The majority of examined risk factors were static risk factors (i.e., criminal history, age, race). Since changing criminal history is not possible, treatment can target "building up new noncriminal behaviors in high-risk situations and building self-efficacy beliefs supporting reform" (Andrews & Bonta, 2010, p. 58). Targeting criminal behavior and beliefs in treatment can help create and strengthen an offender's ability to prevent or stop themselves from participating in criminal activity in the future. IDOC should continue to collect information about offender's criminal history as it can reveal how likely an offender is to commit further crimes after release from prison and could help guide

effective treatment plans. It would be beneficial if IDOC also collected information on an offender's history of juvenile delinquency. This is a theoretically relevant risk factor and future research should evaluate if juvenile delinquency is a risk factor for these four mental health groups under study.

In addition to collecting more extensive information about criminal history background, it would also be advantageous for IDOC to collect information about an offender's beliefs about crime and the law, their social support, quality of relationships, and about their leisure/recreational activities. Gathering information about an offender's attitudes and beliefs about crime are of particular interest because according to social learning theory, having procriminal attitudes and cognitions may increase the risk of committing crimes (Andrews & Bonta, 2010). This was unable to be measured in the current study. Collecting information on these dynamic risk factors could allow for future research to assess the impact these variables have on recidivism for these four mental health groups.

REFERENCE LIST

Alia-Klein, N., O'Rourke, T. M., Goldstein, R. Z., & Malaspina, D. (2007). Insight into illness and adherence to psychotropic medications are separately associated with violence severity in a forensic sample. *Aggressive Behavior*, *33*(1), 86-96.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Retrieved from http://dsm.psychiatryonline.org/book.aspx?bookid=556

Andrews, D. A., & Bonta, J. L. (1995). *Level of Service Inventory-Revised.* Toronto: Multi-Health Systems.

Andrews, D. A. & Bonta, J. (2010). *The psychology of criminal conduct* (5th ed.). New Providence, NJ: Anderson.

Andrews, D. A., Bonta, J., & Hoge, R. D. (1990). Classification for effective rehabilitation: Rediscovering psychology. *Criminal Justice and Behavior, 17*(1)*,* 19–52.

Andrews, D. A., Bonta, J., & Wormith, S. J. (2000). *Level of Service/Case Management Inventory: LS/CMI*. Toronto, Canada: Multi-Health Systems.

Andrews, D. A., Bonta, J., & Wormith, S. J. (2006). The recent past and near future of risk and/or need assessment. *Crime and Delinquency, 52*(1), 7-27.

Baillargeon, J., Binswanger, I. A., Penn, J. V., Williams, B. A., & Murray, O. J. (2009). Psychiatric disorders and repeat incarcerations: The revolving prison door. *American Journal of Psychiatry, 166*(1), 103.

Baillargeon, J., Penn, J. V., Knight, K., Harzke, A. J., Baillargeon, G., & Becker, E. A. (2010). Risk of reincarceration among prisoners with co-occurring severe mental illness and substance use disorders. *Administration and Policy in Mental Health and Mental Health Services Research, 37*(4), 367-374.

Balyakina, E., Mann, C., Ellison, M., Sivernell, R., Fulda, K. G., Sarai, S. K., & Cardarelli, R. (2014). Risk of future offense among probationers with co-occurring substance use and mental health disorders. *Community Mental Health Journal, 50*(3), 288-295.

Becker, M. A., Andel, R., Boaz, T., & Constantine, R. (2011). Gender differences and risk of arrest among offenders with serious mental illness. *The Journal of Behavioral Health Services & Research*, *38*(1), 16-28.

Bonta, J. (1995). Risk-needs assessment and treatment. In A. T. Harland, (Ed.), *Choosing correctional options that work: Defining the demand and evaluating the supply* (pp. 18-32). Sage Publications.

Bonta, J. (2002). Offender risk assessment: Guidelines for selection and use. *Criminal Justice and Behavior, 29*(4), 355-379.

Bonta, J., Blais, J., & Wilson, H. A. (2014). A theoretically informed meta-analysis of the risk for general and violent recidivism for mentally disordered offenders. *Aggression and Violent Behavior, 19*(3), 278-287.

Bonta, J., Law, M., & Hanson, K. (1998). The prediction of criminal and violent recidivism among mentally disordered offenders: A meta-analysis. *Psychological Bulletin, 123*(2), 123–142.

Brame, R., Paternoster, R., Mazerolle, P., & Piquero, A. (1998). Testing for the equality of maximum-likelihood regression coefficients between two independent equations. *Journal of Quantitative Criminology, 14*(3), 245–261.

Brennan, T., & Oliver, W. L. (2000). Evaluation of reliability and validity of COMPAS scales: National aggregate sample. Traverse City, MI: Northpointe Institute for Public Management.

Bureau of Justice Statistics. (2016). *Prisoners in 2015*.

Campbell, M. A., French, S., & Gendreau, P. (2009). The prediction of violence in adult offenders a meta-analytic comparison of instruments and methods of assessment. *Criminal Justice and Behavior*, *36*(6), 567-590.

Canales, D. D., Campbell, M. A., Wei, R., & Totten, A. E. (2014). Prediction of general and violent recidivism among mentally disordered adult offenders: Test of the Level of Service/Risk–Need–Responsivity (LS/RNR) instrument. *Criminal Justice and Behavior*, *41*(8), 971-991.

Caudy, M. S., Durso, J. M., & Taxman, F. S. (2013). How well do dynamic needs predict recidivism? Implications for risk assessment and risk reduction. *Journal of Criminal Justice*, *41*(6), 458-466.

Center for Behavioral Health Statistics and Quality. (2016). *Key substance use and mental health indicators in the United States: Results from the 2015 National Survey on Drug Use and Health* (HHS Publication No. SMA 16-4984, NSDUH Series H-51). Retrieved from http://www.samhsa.gov/data/

Cloyes, K. G., Wong, B., Latimer, S., & Abarca, J. (2010). Time to prison return for offenders with serious mental illness released from prison: A survival analysis. *Criminal Justice and Behavior*, *37*(2), 175-187.

Copas, J., & Marshall, P. (1998). The Offender Group Reconviction Scale: The statistical reconviction score for use by probation officers. *Journal of the Royal Statistical Society, 47C*, 159-171.

Degiorgio, L., & DiDonato, M. (2014). Predicting probationer rates of reincarceration using dynamic factors from the Substance Abuse Questionnaire-Adult Probation III (SAQ-Adult Probation III). *American Journal of Criminal Justice, 39*(1), 94-108.

Douglas, K. S., Guy, L. S., & Hart, S. D. (2009). Psychosis as a risk factor for violence to others: A meta-analysis. *Psychological Bulletin, 135*(5), 679-706.

Douglas, K. S., & Webster, C. D. (1999). The HCR-20 violence risk assessment scheme concurrent validity in a sample of incarcerated offenders. *Criminal Justice and Behavior*, *26*(1), 3-19.

Dowden, C., & Brown, S. L. (2002). The role of substance abuse factors in predicting recidivism: A meta-analysis. *Psychology, Crime & Law, 8*(3), 243-264.

Elbogen, E. B., & Johnson, S. C. (2009). The intricate link between violence and mental disorder: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry*, *66*(2), 152-161.

Ferguson, A. M., Ogloff, J. R., & Thomson, L. (2009). Predicting recidivism by mentally disordered offenders using the LSI-R: SV. *Criminal Justice and Behavior*, *36*(1), 5-20.

Gendreau, P., Little, T., & Goggin, C. (1996). A meta-analysis of the predictors of adult offender recidivism: What works! *Criminology, 34(*4), 575-607.

Girard, L., & Wormith, J. S. (2004). The predictive validity of the Level of Service Inventory-Ontario Revision on general and violent recidivism among various offender groups. *Criminal Justice and Behavior*, *31*(2), 150-181.

Grubin, D. (1998). *Sex offending against children: Understanding the risk* (Vol. 99). London, United Kingdom: Home Office, Policing and Reducing Crime Unit, Research, Development and Statistics Directorate.

Håkansson, A., & Berglund, M. (2012). Risk factors for criminal recidivism–a prospective follow-up study in prisoners with substance abuse. *BMC psychiatry*, *12*(1), 111.

Hanson, R. K., & Thornton, D. (1999). *Static 99: Improving actuarial risk assessments for sex offenders* (Vol. 2). Ottawa, Ontario: Solicitor General Canada.

Harris, G. T., Rice, M. E., & Quinsey, V. L. (1993). Violent recidivism of mentally disordered offenders the development of a statistical prediction instrument. *Criminal Justice and Behavior*, *20*(4), 315-335.

Helmus, L. M., & Thornton, D. (2015). Stability and predictive and incremental accuracy of the individual items of Static-99R and Static-2002R in predicting sexual recidivism: A meta-analysis. *Criminal Justice and Behavior*, *42*(9), 917-937.

Hoffman, P. B. (1994). Twenty years of operational use of a risk prediction instrument: The United States parole commission's salient factor score. *Journal of Criminal Justice*, *22*(6), 477-494.

Ireland, T., & Widom, C. S. (1994). Childhood victimization and risk for alcohol and drug arrests. *International Journal of the Addictions*, *29*(2), 235-274.

Jaffe, A., Du, J., Huang, D., & Hser, Y. (2012). Drug-abusing offenders with comorbid mental disorders: Problem severity, treatment participation, and recidivism. *Journal of Substance Abuse Treatment, 43*(2), 244-250.

Junginger, J., Claypoole, K., Laygo, R., & Crisanti, A. (2006). Effects of serious mental illness and substance abuse on criminal offenses. *Psychiatric Services, 57*(6), 879–882.

Kelly, C. E., & Welsh, W. N. (2008). The predictive validity of the Level of Service Inventory—Revised for drug-involved offenders. *Criminal Justice and Behavior*, *35*(7), 819-831.

Kingston, D. A., Olver, M. E., Harris, M., Booth, B. D., Gulati, S., & Cameron, C. (2016). The relationship between mental illness and violence in a mentally disordered offender sample: Evaluating criminogenic and psychopathological predictors. *Psychology, Crime & Law*, *22*(7), 678-700.

Knight, K., Simpson, D. D., & Hiller, M. L. (2002). Screening and referral for substance-abuse treatment in the criminal justice system. In C. G. Leukefeld, F. Tims, & D. Farabee (Eds.), *Treatment of drug offenders: Policies and issues* (pp. 259-272). New York: Springer.

Kraemer, H. C., Kazdin, A. E., Offord, D. R., Kessler, R. C., Jensen, P. S., & Kupfer, D. J. (1997). Coming to terms with the terms of risk. *Archives of General Psychiatry*, *54*(4), 337-343.

Lam, H. P. (2014). *A meta-analysis of the prediction of violence among adults with mental disorders* (Doctoral Dissertation). Retrieved from ProQuest Dissertations & Theses Global. (Order No. 3642628)

Langan, P. A., & Levin, D. J. (2002). Recidivism of prisoners released in 1994. *Federal Sentencing Reporter*, *15*(1), 58-65.

Large, M. M., & Nielssen, O. (2011). Violence in first-episode psychosis: A systematic review and meta-analysis. *Schizophrenia Research*, *125*(2), 209-220.

Lawless, J. F. (1987). Negative binomial and mixed Poisson regression. *The Canadian Journal of Statistics, 15*(3), 209–225.

Lipsey, M., & Wilson, D. (1998). *Effective intervention for serious juvenile offenders*. In R. Loeber & D. Farrington (Ed.). Thousand Oaks, CA: Sage.

Lovell, D., Gagliardi, G. J., & Peterson, P. D. (2002). Recidivism and use of services among persons with mental illness after release from prison. *Psychiatric Services, 53*(10), 1290-1296.

Matejkowski, J., & Ostermann, M. (2015). Serious mental illness, criminal risk, parole supervision, and recidivism: Testing of conditional effects. *Law and Human Behavior, 39*(1), 75-86.

McCormick, S., Peterson-Badali, M., & Skilling, T. A. (2015). Mental health and justice system involvement: A conceptual analysis of the literature. *Psychology, Public Policy, and Law, 21*(2)*,* 213-225.

Meade, B., Steiner, B., Makarios, M., & Travis, L. (2012). Estimating a dose–response relationship between time served in prison and recidivism. *Journal of research in crime and delinquency*, *50*(4), 525-550.

Messina, N., Burdon, W., Hagopian, G., & Prendergast, M. (2004). One year return to custody rates among co-disordered offenders. *Behavioral Sciences & the Law*, *22*(4), 503-518.

Monahan, J. (1981). Predicting violent behavior: An assessment of clinical techniques. Beverly Hills, CA: Sage.

Monahan, J. (2012). The individual risk assessment of terrorism. *Psychology, Public Policy, and Law*, *18*(2), 167.

Monahan, J., Steadman, H. J., Appelbaum, P. S., Grisso, T., Mulvey, E. P., Roth, L. H., ... & Silver, E. (2006). The Classification of Violence Risk. *Behavioral Sciences & the Law, 24*(6), 721-730.

Monahan, J., Steadman, H. J., Robbins, P. C., Silver, E., Appelbaum, P. S., Grisso, T., ... & Roth, L. H. (2000). Developing a clinically useful actuarial tool for assessing violence risk. *The British Journal of Psychiatry*, *176*(4), 312-319.

Monahan, J., Steadman, H. J., Silver, E., Appelbaum, P. S., Robbins, P. C., Mulvey, E. P., ... & Banks, S. (2001). Rethinking risk assessment: The MacArthur study of mental disorder and violence. Oxford University Press.

Motiuk, L. L. (1997). Classification for correctional programming: The offender intake assessment (OIA) process. *Forum on Corrections Research*, *9*, 18-22.

Ogloff, J. R., Lemphers, A., & Dwyer, C. (2004). Dual diagnosis in an Australian forensic psychiatric hospital: Prevalence and implications for services. *Behavioral Sciences & the Law*, *22*(4), 543-562.

Ogloff, J. R., Talevski, D., Lemphers, A., Wood, M., & Simmons, M. (2015). Co-occurring mental illness, substance use disorders, and antisocial personality disorder among clients of forensic mental health services. *Psychiatric Rehabilitation Journal*, *38*(1), 16-23.

Olson, D. E., Dooley, B., & Kane, C. M. (2004). *The relationship between gang membership and inmate recidivism*. Chicago, Illinois: Illinois Criminal Justice Information Authority.

Olson, D. E., Stalans, L. J., & Escobar, G. (2016). Comparing male and female prison releases across risk factors and postprison recidivism. *Women & Criminal Justice,* 1-23.

Peterson, J., Skeem, J. L., Hart, E., Vidal, S., & Keith, F. (2010). Analyzing offense patterns as a function of mental illness to test the criminalization hypothesis. *Psychiatric Services*, *61*(12), 1217-1222.

Peterson, J. K., Skeem, J., Kennealy, P., Bray, B., & Zvonkovic, A. (2014). How often and how consistently do symptoms directly precede criminal behavior among offenders with mental illness? *Law and Human Behavior, 38*(5), 439-449.

Phillips, H. K., Gray, N. S., MacCulloch, S. I., Taylor, J., Moore, S. C., Huckle, P., & MacCulloch, M. J. (2005). Risk assessment in offenders with mental disorders: Relative efficacy of personal demographic, criminal history, and clinical variables. *Journal of Interpersonal Violence*, *20*(7), 833-847.

Reich, W. A., Picard-Fritsche, S., Lebron, L., & Hahn, J. W. (2015). Predictors of mental health court program compliance and rearrest in Brooklyn, New York. *Journal of Offender Rehabilitation*, *54*(6), 391-405.

Rezansoff, S. N., Moniruzzaman, A., Gress, C., & Somers, J. M. (2013). Psychiatric diagnoses and multiyear criminal recidivism in a Canadian provincial offender population. *Psychology, Public Policy, and Law*, *19*(4), 443.

Silver, E. (2006). Understanding the relationship between mental disorder and violence: The need for a criminological perspective. *Law and Human Behavior, 30*(6), 685-706.

Singh, J. P., & Fazel, S. (2010). Forensic risk assessment: A meta-review. *Criminal Justice and Behavior*, *37*(9), 965-988.

Skeem, J., Kennealy, P., Monahan, J., Peterson, J., & Appelbaum, P. (2016). Psychosis uncommonly and inconsistently precedes violence among high-risk individuals. *Clinical Psychological Science, 4*(1), 40-49.

Skeem, J. L., Manchak, S., & Peterson, J. K. (2011). Correctional policy for offenders with mental illness: Creating a new paradigm for recidivism reduction. *Law and Human Behavior, 35*(2), 110-126.

Skeem, J. L., & Monahan, J. (2011). Current directions in violence risk assessment. *Current Directions in Psychological Science*, *20*(1), 38-42.

Skeem, J. L., Winter, E., Kennealy, P. J., Louden, J. E., & Tatar, J. R., II. (2014). Offenders with mental illness have criminogenic needs, too: Toward recidivism reduction. *Law and Human Behavior, 38*(3), 212-224.

Sneed, E. E. (2015). *Predictors of prison-based drug treatment in Illinois* (Master's thesis). Available from ProQuest Dissertations & Theses Global. (Order No. 10002965).

Stahler, G. J., Mennis, J., Belenko, S., Welsh, W. N., Hiller, M. L., & Zajac, G. (2013). Predicting recidivism for released state prison offenders examining the influence of individual and neighborhood characteristics and spatial contagion on the likelihood of reincarceration. *Criminal Justice and Behavior*, *40*(6), 690-711.

Stalans, L. J., & Lurigio, A. J. (2015). Parenting and intimate relationship effects on women offenders' recidivism and noncompliance with probation. *Women & Criminal Justice*, *25*(3), 152-168.

Stalans, L. J., & Seng, M. (2007). Identifying subgroups at high risk of dropping out of domestic batterer treatment the buffering effects of a high school education. *International Journal of Offender Therapy and Comparative Criminology*, *51*(2), 151-169.

Stalans, L. J., Yarnold, P. R., Seng, M., Olson, D. E., & Repp, M. (2004). Identifying three types of violent offenders and predicting violent recidivism while on probation: A classification tree analysis. *Law and human behavior*, *28*(3), 253.

Steadman, H. J. & Cocozza, J. J. (1974). *Careers of the criminally insane: Excessive social control of deviance.* Lexington, MA: Lexington Books.

Steadman, H. J., Mulvey, E. P., Monahan, J., Robbins, P. C., Appelbaum, P. S., Grisso, T., ... & Silver, E. (1998). Violence by people discharged from acute psychiatric inpatient facilities and by others in the same neighborhoods. *Archives of General Psychiatry*, *55*(5), 393-401.

Substance Abuse and Mental Health Services Administration. (2016). *Screening and assessment of co-occurring disorders in the justice system.* (HHS Publication No. (SMA)-15-4930). Retrieved from http://store.samhsa.gov/shin/content//SMA15-4930/SMA15-4930.pdf

Swanson, J., Estroff, S., Swartz, M., Borum, R., Lachicotte, W., Zimmer, C., & Wagner, R. (1997). Violence and severe mental disorder in clinical and community populations: The effects of psychotic symptoms, comorbidity, and lack of treatment. *Psychiatry*, *60*(1), 1-22.

Swanson, J. W., Swartz, M. S., Van Dorn, R. A., Elbogen, E. B., Wagner, H. R., Rosenheck, R. A., ... & Lieberman, J. A. (2006). A national study of violent behavior in persons with schizophrenia. *Archives of general psychiatry*, *63*(5), 490-499.

Swartz, J. A., & Lurigio, A. J. (2007). Serious mental illness and arrest the generalized mediating effect of substance use. *Crime & Delinquency*, *53*(4), 581-604.

Torrey, E. F. (2011). Stigma and violence: Isn't it time to connect the dots? *Schizophrenia Bulletin, 37*(5), 892-896.

Van Dorn, R., Volavka, J., & Johnson, N. (2012). Mental disorder and violence: is there a relationship beyond substance use? *Social Psychiatry and Psychiatric Epidemiology*, *47*(3), 487-503.

Webster, C. D., Douglas, K. S., Eaves, D., & Hart, S. D. (1997). *HCR-20: Assessing risk for violence (Version 2).* Vancouver, British Columbia, Canada: Mental Health, Law, and Policy Institute, Simon Fraser University.

Wilson, A. B., Draine, J., Hadley, T., Metraux, S., & Evans, A. (2011). Examining the impact of mental illness and substance use on recidivism in a county jail. *International Journal of Law and Psychiatry, 34*(4), 264-268.

Widom, C. S. (1989). Child abuse, neglect, and violent criminal behavior. *Criminology*, *27*(2), 251-271.

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