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Substance Abuse and Mental Disorders Among State and Federal Prison Inmates

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A thesis

presented to

the faculty of the Department of Criminal Justice and Criminology

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Master of Arts in Criminal Justice and Criminology

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by

John Richard Haggerty

August 2011

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Keywords: substance abuse, mental disorder, comorbidity, prison, inmates

ABSTRACT

Substance Abuse and Mental Disorders Among State and Federal Prison Inmates

by

John Richard Haggerty

Research consistently demonstrates that prison inmates are more likely than the general population to suffer from both mental disorders and substance abuse. The current study explored the relationship between diagnoses of mental disorders and maladaptive substance use among state and federal prison inmates. Linear regression analysis was used to ascertain the prevalence of comorbidity of substance abuse and mental disorder, and multiple models were constructed to determine the direction of relationship between the two disorders. Overall, mental disorders and substance use were positively related within the sample, though mixed conclusions were drawn regarding the exact nature of their relationship. Recommendations for future study and improvements to the specificity of mental disorders and substance use measures are made.

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CHAPTER 1

INTRODUCTION

The incarceration rate in the United States has experienced exponential growth in

the past 30 years (Blumstein & Beck, 1999; Raphael & Stoll, 2009), absorbing an

increasing amount of individuals diagnosed with mental disorders (Lurigio, Rollins, &

Fallon, 2004) and drug use disorders (Belinko, 2000). The increased use of incarceration

is further complicated when inmates diagnosed with both substance use disorders and

mental disorders enter the corrections system (Baillargeon et al., 2009) due to the

difficulty of identifying and treating the co-occurrence of these two disorders system both

in the general public (Schneider et al., 2001) and within prisons (Peters & Hills, 1997).

The result is the continued incarceration of individuals with either mental illness, drug

addiction, or both, and attempts to place them within treatment networks that may

actually exacerbate the illness and make future offending more likely.

Substance Abuse Among Prisoners

Drug offenders constitute a significant percentage of prison populations.

Approximately 56% of state and federal prison inmates used drugs in the month before

the offense that resulted in their incarceration; drug use habits in 53% of state prisoners

and 45% of federal prisoners were consistent with abuse or dependence (Mumola &

Karberg, 2006). Furthermore, the criminal justice system has increasingly condemned

drug offenders to prison, as the rate of prison admissions of drug offenders per 100,000

increased from 8.73 in 1984 to 43.93 in 2002, far exceeding those of murder, rape, and

robbery in the same time period (Raphael & Stoll, 2009).

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<u>Definitions</u>

"Substance abuse" is often used interchangeably with "substance dependence," though abuse and dependence occupy different ends of a continuum of destructive behavior. "Abuse" refers to use of alcohol or drugs that interferes with daily functioning or that jeopardizes important relationships, but does not involve tolerance with continued use or withdrawal symptoms if substance use is suddenly discontinued (American Psychiatric Association, 2000; Brook, Pahl, & Rubenstone, 2008). "Dependence" refers to substance use that meets the criteria for abuse with the additional influence of tolerance or withdrawal if the user attempts to taper or discontinue substance use (American Psychiatric Association, 2000; Brook et al., 2008).

Furthermore, distinctions between early, middle, and late stage addiction are drawn in literature provided to substance addicts in an attempt to help recovering addicts recognize destructive behaviors before they become unmanageable. Early stage addiction involves behaviors such as sneaking drugs or alcohol, preoccupation with their use, memory blackouts, and discomfort in situations that do not involve alcohol or drug use. Middle stage addiction behaviors include loss of control over life, hiding and protecting clandestine supplies of drugs and alcohol, and failed attempts to control alcohol and drug use. Behaviors observed in late stage addiction include tremors and shakes when not using drug or alcohol, inability to think clearly, loss of ability to work, and loss of excuses to use drugs or alcohol (Hazelden Foundation, 2002). Treatment of addiction in correctional contexts requires substance dependent prisoners to recognize the nature and extent of their addiction in order to neutralize the thinking that leads to drug use, such as self-pity or belief that the individual cannot function without alcohol or drugs (Hazelden

Foundation, 2002). While the purpose of this study depends upon the distinction of abuse and dependence, the term "maladaptive substance use" is occasionally used to collectively describe abuse and dependence as well as misuse of alcohol and drugs.

<u>Mental Disorders Among Prisoners</u>

A similar increase has been observed in the percentage of persons in correctional populations diagnosed with a mental disorder in their lifetime, constituting 56.2% of state and federal prisoners in 2004 (James & Glaze, 2006). They are now housed in prisons with greater frequency than in mental hospitals (Raphael & Stoll, 2009). The interaction of the mentally ill with the criminal justice system has been made more likely and the consequences made more costly to the offender as a result of the confluence of advances in mental health philosophy with developments in the law. Treatment of individuals diagnosed with mental disorders has evolved from isolation and warehousing of "odd" individuals from the rest of society, to identification of mental disorders as an individual medical problem treatable through institutional therapy, and finally to the early identification and treatment of mental disorder through the use of community health programs (Marx, Rieker, & Ellison, 1974; Morrissey & Goldman, 1984). It is the transition from the second to the third phase of mental healthcare practice, known as deinstitutionalization, that served as the impetus for contacts with the criminal justice system, as healthcare moved from the use of state mental hospitals to the use of community outpatient services to treat the mentally ill (Marx, Rieker, & Ellison, 1974; Morrissey & Goldman, 1984).

Acting in tandem with this was the criminalization of the mentally ill through the increased use of the criminal justice system as a point of entry for mentally ill offenders as well as buttresses made to mental health law that made civil commitment more

difficult. While the odd behavior relative to the population of mentally ill offenders has historically been off-putting to citizens (Marx, Rieker, & Ellison, 1974), the removal of remedies other than arrest meant that the police, who often serve as the first point of contact with the mentally ill, use the power of arrest either because they have little recourse available or because they misinterpret the behavior of the mentally ill as hostile.

<u>Definitions</u>

Many different behaviors potentially constitute a mental disorder, though the Diagnostic and Statistical Manual Text Revision fundamentally distinguishes disorders as "[…] clinically significant behavioral or psychological syndrome[s] or pattern[s]" within individuals that occur with a current distress or disability, or with a significant threat of loss through suffering, death, pain, disability or loss of freedom (American Psychiatric Association, 2000). Diagnoses of specific disorders are dependent upon specific behaviors that are discussed later in this section, but the behavior itself is not considered a disorder unless it is dysfunctional or causes marked impairment in the individual. Thus, frequent thoughts of death and dying would not be unusual in a mortuary employee or police officer, as death is frequently encountered in the course of daily business. If a person's fear of death or obsession over death prevents healthy functioning for a prolonged period, usually for 2 or more weeks, then a mental health professional may attempt to determine if the individual suffers from a depressive disorder (American Psychiatric Association, 2000).

This study focused upon the diagnosis within an individual's lifetime of five specific disorders: depressive disorders, bipolar disorders, schizophrenia or other

psychotic disorders, posttraumatic stress disorder, and anxiety disorders other than posttraumatic stress disorder. These disorders are briefly described below.

Depressive disorders. Depressive disorders are a specific type of mood disorder characterized by a persistently sad or "empty" mood (American Psychiatric Association, 2000). These tend to be more prevalent among women, with the lifetime risk of occurrence ranging from 10% to 25% of women, and 5% to 12% of men (American Psychiatric Association, 2000). A meta-analysis by Fazel and Danesh (2002) summarized the findings of 31 studies and determined approximately 10% of male prisoners and 12% of female prisoners have been diagnosed with a depressive disorder.

Bi-polar disorders. Bi-polar disorders are characterized by the occurrence of one or more manic episodes, or periods of abnormally elevated mood, with one or more depressive episodes. The manic episode can also co-occur with a "mixed" episode during which the criteria for a manic episode and a depressive episode are met nearly every day for a week or more (American Psychiatric Association, 2000). Lifetime prevalence of bi-polar disorder in the general population ranges from 0.4% to 1.6% for bipolar I, and 0.5% for bi-polar II (American Psychiatric Association, 2000).

Schizophrenia or other psychotic disorder. A universal definition of "psychotic" behavior is yet nonexistent, though the narrowest definition offered by the DSM-IV TR is restricted to "delusions or prominent hallucinations, with hallucinations occurring in the absence of insight into their pathological nature (American Psychiatric Association, 2000)." "Psychotic disorder" is a blanket term the DSM-IV TR uses to describe a group of different disorders that feature psychotic behavior including Schizophrenia, Schizophreniform Disorder, Schizoaffective disorder, Substance-Induced Psychotic

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Disorder, and Psychotic Disorders Not Otherwise Specified. The most complete available lifetime prevalence data for psychotic disorders in the general population is for schizophrenia, which is estimated between 0.5% and 1.5% of the adult population (American Psychiatric Association, 2000). Within prisons, 3.7% of men and 4% of women are diagnosed with a psychotic illness, though the study methodology does not distinguish what type of psychotic illness is considered (Fazel & Danesh, 2002).

Anxiety disorders. Anxiety disorders are a group of disorders characterized by a panic attack or a period of intense fear or discomfort in the absence of actual danger upon presentation of certain stimuli (American Psychiatric Association, 2000). The fear or discomfort is usually accompanied by physical or cognitive symptoms including sweating, trembling, a feeling of choking, nausea or abdominal distress, a fear of losing control, and a fear of dying. These attacks can occur either in the presence of a specific stressor such as an insect the individual fears, by being placed in difficult situations ranging in severity from embarrassing moments up to military combat, through use or exposure to drugs or chemicals, or attacks can manifest themselves through chronic and excessive worrying over an extended period (American Psychiatric Association, 2000). Lifetime prevalence rates for anxiety disorders in the general public range from a low of 1% for panic disorders with or without agoraphobia to a high of 13% for social phobias (American Psychiatric Association, 2000).

Posttraumatic Stress Disorder. Posttraumatic stress disorder, or PTSD, is a specific type of anxiety disorder distinguished by manifestation of a panic attack after exposure to a traumatic stressor, and through subsequent exposure to stimuli that recall the trauma (American Psychiatric Association, 2000). PTSD is distinguishable from

trauma directly following exposure to trauma by the individual's avoidance of stimuli or situations reminiscent of the trauma, even in the absence of real danger; a survivor of a rape that took place in an elevator may develop intense fear and anxiety within elevators and will consequently avoid using them. Trauma may be the result of first-hand experience, can be vicariously experienced by witnessing a traumatic event such as a violent automobile accident or learning of a traumatizing event such as the death of one's child through others. The lifetime prevalence rate for posttraumatic stress disorder in the general public is approximately 8% (American Psychiatric Association, 2000).

<div align="center">Cooccurring Disorder</div>

Cooccurring disorder, also known as co-morbidity and dual diagnosis (Watkins, Lewellen & Barrett, 2001), is the occurrence of a mental disorder and a substance use disorder in one individual. A precise and universally accepted definition of cooccurring disorder yet eludes psychiatric research due to the risk of estimate inflation if appropriate thresholds are not applied to the definition of "mental disorder." Some definitions consider only Axis I diagnoses such as mood disorders while excluding personality disorders, which fall within Axis II (Baillargeon, Penn, Thomas, Temple, Baillargeon, & Murray, 2009; Watkins, Lewellen, & Barrett, 2001). Other definitions accept personality disorders and other Axis II disorders as part of a comorbid diagnosis (Messina, Burdon, Hagopian, & Prendergast, 2004).

Cooccurring disorder is as difficult to diagnose as it is to define. A crucial feature of cooccurring disorder is the interaction of symptoms of mental disorder with symptoms of substance use (American Psychiatric Association, 2000; Watkins, Lewellen, & Barrett, 2001), and the similarity between symptoms of chemical withdrawal and mental

disorders frequently confound attempts to diagnose the primary condition (American Psychiatric Association, 2000; Gorski, 1994; Watkins, Lewellen, & Barrett, 2001).

Cooccurring disorder is a relatively new topic in psychological literature, but extant literature generally agrees that substance abuse is more likely among individuals with a mental disorder than among those not so diagnosed (Baillargeon et al., 2010; Reiger et al., 1990; Sacks & Ries, 2006), Furthermore, co-occurring disorder is more likely among incarcerated populations than among the general public (Diamond, Wang, Holzer, Thomas, & Cruser, 2001; Reiger et al., 1990; Teplin, 1990). The strong association of mental disorders and substance use is attributed to either increased sensitivity to drugs among those with a mental disorder or to the use of drugs and alcohol to medicate a negative mental state (American Psychiatric Association, 2000; Khantzian, 1997, 2005; Sacks & Ries, 2006). The higher incidence of co-occurring disorder among prisoners is generally attributed to the dual influence of changes with the mental health and criminal justice systems. Changes in healthcare policy by shifting from the use of institutional means such as state mental hospitals and asylums and bolstering safeguards in the use of civil commitment (Grob, 1991; Marx, Rieker, & Ellison, 1974; Quanbeck, Frye, & Altshuler, 2003) have increased patients' rights and shifted the burden of care from institutions to communities. While this was engineered to improve the quality of healthcare for people diagnosed with mental disorders, the criminal justice system, in turn, is forced to take the responsibility of housing offenders diagnosed with substance use and mental disorders because community healthcare systems have refused to assume responsibility for violent or substance dependent patients (Laberge & Morin, 1995; Watkins, Lewellen, & Barrett, 2001)

Current Study

The current study was conducted to determine the prevalence of co-occurring disorder within a nationally representative sample of federal and state prison inmates. Previous studies of co-occurring disorders have relied upon much smaller samples, usually restricted to institutions or state departments of correction. This study also follows the model of Reiger et al. (1990) in that it considers both sides of the co-morbidity question: are diagnoses of mental disorders more likely among inmates who reported substance abuse and dependence, and are substance use disorders more likely among inmates who reported diagnoses of mental disorders? Additionally, the current study was an attempt to find support for the self-medication hypothesis by determining whether a relationship between mental disorders and substance use existed in the population, whether the relationship was strong enough to merit predictions, and whether this relationship held true for certain mental disorder diagnoses over others.

CHAPTER 2

LITERATURE REVIEW

Substance abuse and mental disorders among prisoners have been well-documented in criminal justice and psychological literature, as has the co-occurrence of the two. Mental health and substance abuse treatment literature have suggested explanations for the connection between the two, though disagreements regarding the direction of their relationship persist. This literature review consists of three separate sections that discuss literature across the fields of substance abuse, mental disorders and cooccurring disorders as well as a section dedicated to the theoretical foundation for the current research. The first section discusses patterns of substance abuse and dependence along with legal and treatment policies regarding drugs. The next section focuses upon mental disorders, particularly upon the development of criminal justice policies designed to address offenders with mental disorders, the evolution of mental health treatment, and mental health law. An additional section is dedicated to describing the development of co-occurring disorders and their treatment within the mental health and criminal justice systems. Finally, the theoretical framework for the current analysis is described.

Substance Use Among Prisoners

Alcohol and drug abuse is recognized as a serious problem within corrections and the public at large, though substance abuse is much more prevalent among prison inmates (Belinko & Peugh, 2005; Regier et al., 1990). Prevalence estimates tend to vary with study methodology. A descriptive report derived from the 2004 Survey of Inmates in State and Federal Correctional Facilities, the data that were analyzed in this study,

revealed 69.2% of state and 64.3% of federal prisoners had used drugs for once a week

for at least a month in the year prior to admission to prison (Mumola & Karberg, 2006).

This study analyzed data obtained from a 2004 survey of state and federal prison

inmates because a large percentage of people are being housed in correctional facilities,

and the number of inmates with substance abuse problems including dependence upon

drugs and alcohol has increased significantly from previous decades. Belinko (2000)

pointed out that part of the problem is the lack of adequate substance abuse treatment

among drug-abusing offenders, combined with stringent antidrug policies. Combined,

these two forces help explain why the percentage of state prison inmates sentenced for a

drug law violation has increased from 6% in 1980 to 23% in 1996. Additionally, 66%

percent of prisoners in a medium-security prison in Massachusetts admitted to having

used drugs, with 80% of those having used within 3 months of incarceration. Women in

the sample were twice as likely as men to have shared needles, more likely than men to

have experienced confrontations with the law because of illegal drug use or abuse, to

have admitted a drug problem, to have received prior treatment, and to have reported

seeking help for drug use (Conklin, Lincoln, & Tuthill, 2000).

Alcohol abuse and dependence are also significant problems among prisoners.

Alcohol dependence was reported among 17.9% of state prisoners and 12.7% of federal

prisoners in 2004, while alcohol abuse was reported among 18% of state prisoners and

17.7% of federal prisoners (James & Glaze, 2006). Interestingly, the rates of alcohol

dependence and abuse in the same sample were higher among inmates with a co-

occurring mental disorder; 30.4% of state prisoners and 25.1% of federal prisoners with a

diagnosed mental disorder reported dependence upon alcohol, while 20.4% of state and

18.6% of federal prisoners reported alcohol abuse along with a co-occurring mental disorder (James & Glaze, 2006). Conklin, Lincoln, and Tuthill, (2000) reported that 66% of men and 60% of women in a reported sample of prisoners had consumed alcohol within 3 months of admission; 33% of these drinkers were binge drinkers, and nearly 75% were regular binge drinkers. Ongoing substance abuse disorders in prison inmates, whether alcohol or drug related, are particularly worrisome as released inmates can potentially become readdicted if not given adequate treatment in prison or supervision in the community upon discharge. Released prisoners are not given adequate parole support in the best of circumstances, and those who are drug addicted will encounter significant difficulty when overworked parole officers are unable to provide adequate supervision to prevent parolees from acquiring and abusing drugs (Travis & Petersilia, 2001).

Correctional facilities have responded to the issue of alcohol and drug abuse by offering treatment programs in both state and federal prisons. The quality of correctional programming has improved significantly over time. Medical services ranging from counseling to dentistry were formerly administered by the inmates themselves, with professional staff filling these roles beginning in the 1960s (McDonald, 1999). Improvements to correctional programming over the intervening years have made it a crucial element of successful reintegration, such that parolees who successfully complete substance abuse counseling while in prison and maintain a group of supportive peers outside of prison are more likely to finish a parole term than inmates who do not take advantage of these resources (Bahr, Harris, Fisher, & Armstrong, 2009). Nonetheless, correctional treatment programs have been criticized for failing to take into account the chronic and relapsing nature of drug use, focusing instead on the crimes connected to

drug use (Leukefeld, Farabee, & Tims, 2002). Treatment within the criminal justice system is also said to be suffering from an identity crisis in which the utility of rehabilitation is recognized, but the execution is undermined by the use of punishments that increase the likelihood of failure upon release and the lack of a support system that gives deference to the nature of drug abuse and dependence (Travis & Petersilia, 2001).

<u>Substance Abuse Patterns</u>

Substance abuse and addiction are not experienced equally among individuals who eventually come into contact with the criminal justice system. While substance abuse and dependence are more likely among men outside of prison (Brook et al., 2008), drug dependence and abuse are most often reported among female prisoners as is the use of specific drugs such as methamphetamine (Conklin, Lincoln, & Tuthill, 2000; Mumola & Karberg, 2006; Peters, Strozier, Murrin, & Kearns, 1997). Peters and colleagues (1997) found that a sample of female jail inmates currently enrolled in substance abuse treatment offered by a sheriff's office were more likely than men to report using narcotics such as cocaine. Use of narcotics, use of more than one drug, and use of drugs to alleviate pain were all more likely to be reported among female inmates in a sample of federal prisoners undergoing substance abuse treatment through the Federal Bureau of Prisons (Langan & Pelissier, 2001).

Other dissimilarities exist in the etiology of substance abuse and addiction. The age of onset for alcohol use, itself a predictor of future drug and alcohol dependence (Grant & Dawson, 1998), is lower than that for cocaine as is the peak age at risk of alcohol dependence, and the risk for introduction to alcohol use is greater than for other drugs though the risk of alcohol addiction takes longer to manifest itself than does

cocaine (Wagner & Anthony, 2002). Alcohol abuse without abuse of other drugs was also more frequently reported than drug abuse among a sample of noninstitutionalized individuals suffering from comorbid substance abuse and mental disorders (Bolton, Robinson, & Sareen, 2009), and the odds ratio of comorbid alcohol use disorder was higher than that of comorbid drug use disorder among individuals diagnosed with a mental disorder (Reiger et al., 1990). Additionally, state prisoners are more likely to abuse drugs or be dependent upon drugs than federal prisoners (James & Glaze, 2006; Mumola & Karberg, 2006). Drug use and dependence were also more likely to be reported by white inmates (Mumola & Karberg, 2006) and by prisoners who have sustained sexual or physical assault in the past (Belinko & Peugh, 2005; Mumola & Karberg, 2006).

Drug Control Policy – Historical Overview

Early drug treatment policies. Criminal justice policy with drug offenders has largely recently favored apprehension and punishment of offenders over treatment and rehabilitation. Field (2002) described the progression of substance abuse policy from the first recognized abuse of morphine in the middle to late 1800s to current drug treatment policy. Morphine was widely used as an analgesic during the US Civil War, yet its addictive properties did not become known for some time afterward. Later, coca and its derivative cocaine became widely available through myriad "health tonics," and addiction became even more prevalent with the introduction of the hypodermic syringe in 1900 (Field, 2002). When morphine and cocaine addiction began to present themselves as problems, the first response was the use of private sanitariums, followed later by municipal clinics that treated drug addiction through tapered dosage. These "maintenance

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clinics" were successful until the passage of the Harrison Act of 1914, which was the first

of many federal antidrug regulations intended to regulate the sale and distribution of

drugs. Consistent with the federal government's newly declared official stance against

drugs, tapered dosage became unacceptable, and maintenance clinics were closed by

1925 (Field, 2002). Federally funded hospitals later opened to deal specifically with the

needs of drug-dependent prisoners, though citizens who chose to commit themselves

were also accepted. Federal initiatives further expanded treatment of drug addiction in the

1960s and 1970s with the introduction of grants for local narcotics treatment projects that

expanded the treatment of drug offenders in both community and correctional settings

(Field, 2002).

"Nothing works" and the War on Drugs. Two forces in particular are largely

responsible for the cessation of rehabilitation, the swell of correctional populations and

the prevalence of drug and alcohol abuse among prisoners in particular. The first was the

publication of an article by Martinson (1974) that weakened the perceived utility of

rehabilitative programming. Martinson and his colleagues, as part of the New York State

Governor's Committee on Criminal Offenders' project to bolster rehabilitative services in

state prisons, collected hundreds of reports published between 1945 and 1967 that

reviewed experimental treatment programs. Specifically, the committee's published

report described examination of programs targeted toward educational and vocational

training, group and individual counseling, reintegrative treatment, medical treatment, and

the influence of sentence length; these effects were examined across male and female

populations, as well as for young and adult offenders. The final product revealed that the

efficacy of rehabilitation was not empirically supported, save isolated instances in several

outstanding programs, and reductions in recidivism in certain programs could be explained by factors unrelated to treatment. Martinson's article suggested the inconclusive findings could be explained by inadequate programs, the inability to stop habitual offending through treatment, the inability of contemporary research to detect positive effects of treatment, the stronger influence of deterrence over therapy, or idiosyncrasies in program administration that undermined the programs (Martinson, 1974). While not an affirmative condemnation of rehabilitation, the message "nothing works" was taken from Martinson's study, and rehabilitation gave way to retribution, incapacitation, and deterrence even in the face of numerous studies that supported the utility of rehabilitation, including Martinson's own recantation of his previous study (Cullen & Gendreau, 1989).

Another catalyst in the growth of prison populations was the massive overhaul of justice resources geared toward apprehending and incarcerating drug offenders, known as "The War on Drugs." The colloquial title was derived from then-President Richard Nixon's characterization of drug policy circa 1973 as "all-out global war (Duke, 2009)," and suggested a realignment of justice priorities in response to a perceived need to rid society of drugs and their influence. Defining features of this movement included decreased funding for drug treatment and rehabilitation programs; concomitant increases in law enforcement budgets in the form of federal drug grants, even to smaller districts that did not typically see drug crime (Baum, 1992); and, institution of mandatory minimum sentencing intended to increase punishments for drug crime and remove judicial discretion in drug cases (Tonry, 1994). This open condemnation of drug crime, and of drug users, is consistent with a broader perspective of justice elucidated by Pallone

and Hennessy (2002). The authors observed that belief in the primary purpose of the justice system has shifted from punishment, incapacitation, deterrence, and rehabilitation in vogue with political and social forces throughout history. Whatever purpose the public supported and government was willing to finance became the focus *du jour* of correctional policy. Martinson's article was published in the wake of a period of prisoners' rights during which courts sought to expand the basic rights of inmates and improve unacceptable conditions within prisons (Call, 1995). After Martinson's article and the subsequent meta-analyses undermined support for rehabilitation, correctional policy began deferring more to corrections personnel (Call, 1995), and criminal justice policy became increasingly retributive against drug offenders (Pallone & Hennessy, 2002).

The War on Drugs placed increased strain upon state and federal prisons that is still felt today; the number of incarcerated individuals in state and federal prisons increased from 300,000 in 1980 to over 1 million in 1994 (Field, 2002), with drug offenders constituting 60% of federal and 22% of state prisoners in 1993 (Beck & Gilliard, 1995). Additionally, the per capita imprisonment rate rose significantly in the years following the War on Drugs, from 110 per 100,000 between 1925 and 1973 (Blumstein & Beck, 1999), to 476 per 100,000 starting in 1973 (Blumstein & Beck, 1999). Feinman (1994) noted that drug policies have affected female offenders especially strongly, as narcotics and alcohol abuse violations accounted for at least 4 out of 10 of the top offenses for which women over the age of 18 are most frequently arrested between 1960 and 1991, and 66% of New Jersey state prisoners as of December 31, 1991, were incarcerated for drug offenses. The swell in the percentage of prisoners

sentenced for drug offenders appears to have abated, with the percentage of state prisoners sentenced for drug offenses remaining static at 21% from 1997 to 2004, and the percentage of federal prisoners so sentenced declining from 63% in 1997 to 55% in 2004 (Mumola & Karberg, 2006). Drug offenders nonetheless continue to constitute a significant proportion of state and federal prison populations and often include offenders who suffer from drug dependence.

<div align="center">Mental Disorders Among Prisoners</div>

Prisoners diagnosed with mental disorder pose several challenges to American corrections, particularly in their contribution to prison populations. Inmates who reported a lifetime diagnosis of any mental disorder constituted 56.2% of state prisoners and 44.8% of federal prisoners in 2004 (James & Glaze, 2006), and the percentage of individuals diagnosed with mental disorders in prisons exceeded that of psychiatric hospital inpatients since the mid-1970s (Raphael & Stoll, 2009). Washington state prisons have experienced a 23% increase in admission of prisoners with serious mental disorder between 1998 and 2006 (Bradley-Engen, Cuddleback, Gayman, Morrissey, & Mancuso, 2010). Within prisons management of the mentally disordered by correctional officers is more difficult due to inability of disordered inmates to understand rules or orders, increased risk of confrontation with correctional officers (Hartstone, Steadman, Robbins, & Monahan, 1999; Torrey, 1995), and because of the increased risk of suicide among incarcerated individuals with mental disorders (Charles, Abram, McClelland, & Teplin, 2003). Mentally disordered inmates are also more likely to be abused and exploited by other inmates (Torrey, 1995) and cost more on average to incarcerate than nondisordered inmates (Sigurdson, 2000). Additionally, the mentally disordered are less

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able to understand and assimilate the institutional goals of punishment, undermining the deterrent value of incarceration (Yang, Kadouri, Revah-Levy, Mulvey, & Falissard, 2009).

<u>Mental Disorders Diagnosis Patterns</u>

Estimates of the prevalence of mental disorder among prison populations vary owing to differences in sampling and methodology (Fazel & Danesh, 2002; Torrey, 1995). Fazel and Danesh (2002) estimated through a meta-analysis of 62 surveys that prison inmates were far more likely than people in the general population to suffer from mental disorder, and that incarcerated women were more likely to suffer from a serious mental disorder than incarcerated men. Broken down by type of disorder, up to 7% of men in prison suffered from a psychotic disorder, up to 10% suffered from major depression, and up to 65% suffer from a personality disorder; while up to 4% of women suffered from a psychotic disorder, 12% from major depression, and 42% from a personality disorder. Prevalence and risk for mental disorders is similar to that seen among substance abusers, with females at greater risk for mental disorder than males (James & Glaze, 2006), particularly major depression, anxiety, history of sexual abuse, and the use of prescription medication for a psychological problem (Peters, Strozier, Murrin, & Kearns, 1997). Diagnosis of mental disorder is more prevalent among state inmates, with 56.2% of state and 44.8% of federal prison inmates reportedly suffering from any mental health problem. Additionally, mental disorders are more commonly reported by lower-class inmates; mentally disordered inmates are more likely to have been homeless in the year before incarceration, to have lived in a foster home, to have

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been unemployed, to report lower levels of monthly income, and to have derived income from illegal sources (James & Glaze, 2006).

Determining the prevalence of mental disorders in prison populations is further complicated by the difficulty of detecting it within individual inmates. Hartstone, Steadman, Robbins, and Monahan (1999) surveyed clinical and custodial personnel in prisons from six states to explore the procedures used to identify and treat mentally disordered inmates. The most common reason given for identifying an inmate for mental health treatment was misbehavior or rule infraction, with 52.6% of the sample reporting this as the primary reason for identification. The authors reasoned that many inmates whose behavior does not produce noticeable behavioral problems are overlooked by correctional personnel and fail to receive needed services.

Mental Disorders and Criminal Justice Policy – Historical Overview

Forces similar to those that placed more drug offenders in prisons have encouraged the shift of mentally disordered individuals from the healthcare system to the criminal justice system. A combination of developments in mental health treatment along with the rejection of rehabilitation as the primary goal of criminal justice acted in tandem to increase the influence of the criminal justice system on the lives of mentally ill offenders. The following section discusses the treatment of the mentally ill before the influence of these respective movements, the events leading up to and including the influence of these events, and the results.

Developing the concept of mental health treatment. Morrissey and Goldman (1986) point out that the development of mental health treatment throughout history follows an oscillating pattern similar to that explained by Pallone and Hennessy (2002),

by which public support for theoretical breakthroughs begins with ardent support that gives was to cynicism in the system's ability to meet the expectations of the new theory. Particularly, new developments in mental health care from the early 19th Century onward begin with optimism for the new paradigm's ability to prevent long-term disability by early intervention. The resources built around the new paradigm, created with little practical knowledge of their capability to deal with chronic patients, are soon overwhelmed by the needs of these neediest of patients. With each successive failure comes a feeling of hopelessness and cynicism, resulting in the neglect of the seriously mentally disordered (Morrissey & Goldman, 1986).

Mental disorder and criminality were first identified as related before the 17th Century. Consistent with most social phenomena, the behavior of the mentally ill was explained as a consequence of the supernatural, particularly of the result of the appearance of the full moon and the influence of demons (Marx, Rieker, & Ellison, 1974). The odd behavior of the mentally ill alienated both royalty and commoners alike, often ran afoul of royal decrees and was seen as a threat to social order, and thus the mentally ill were labeled as criminals to be dealt with by royalty or clergy. The first response was to send the ill away on ships; the isolation served to soothe some people while driving others deeper into madness. Later, almshouses and asylums, formally used to house lepers, were used to isolate the mentally disordered to prevent them from troubling civilized society (Marx, Rieker, & Ellison, 1974).

Following shock and disgust over the treatment of the mentally ill within asylums by schoolteacher and social activist Dorothea Dix (Quanbeck, Frye, & Altshuler, 2003), the use of asylums to separate the mentally ill from genteel society later gave way to

"moral treatment" in the early 19th Century. At this point, the "asylums" that served only to incapacitate the mentally disordered were repurposed as hospitals (Marx, Rieker, & Ellison, 1974; Morrissey & Goldman, 1986). The period between 1825 and 1865 saw tremendous growth in the development of these hospitals, owing to the shift in responsibility for the mentally ill from clergy to the state as well as to swells in population due to immigration. Consequently, the mentally ill were drawn largely from incoming immigrant populations, from chronic cases that the previous system could not handle, and from the poor. The therapeutic resources of the hospitals became quickly overwhelmed, and their primary mission redefined from treatment to incapacitation by 1870 (Morrissey & Goldman, 1986). Further development in the field of psychiatric theory, mental health law, and social reform encouraged the creation of state mental hospitals where the seriously and chronically mentally disordered could be placed and treated (Morrissey & Goldman, 1986)

Explaining the Influx of Mentally Disordered Prisoners

Following World War II, another influx of mentally ill individuals into state mental hospitals encouraged two developments in mental health philosophy, practice, and law that are largely responsible for the increase in mentally ill inmates in prisons: deinstitutionalization and criminalization.

Deinstitutionalization. The move toward deinstitutionalization refers to the decreased involvement of governmental mechanisms for managing the mentally ill along with a concomitant strengthening of community mechanisms (Lamb & Bachrach, 2001). Lurigio, Rollins, and Fallon (2004) identify the crux of deinstitutionalization as the shift of the locus of control over health care from psychiatric hospitals to community mental

health centers. This process began around the 1950s in response to several developments in mental health practice. Declining faith in the ability of government to effectively deal with chronic mental disorder was a crucial element, manifested in the fear that mental hospitals were encouraging subservience and submission to hospital staff instead of encouraging independence (Martin, 1955), along with reports of deteriorating conditions and staff morale in state mental hospitals resulting from increased care of chronic patients (Grob, 1991). Another key element in deinstitutionalization was the shift in psychiatric theory from psychoanalysis to models that took into account the influence of environment and social interaction in the development and well-being of mental patients (Grob, 1991; Marx, Rieker, & Ellison, 1974). Finally, the development of therapies that did not rely upon institutional care allowed for effective treatment in the patient's home. Therapies such as outpatient counseling and psychotropic drugs were heralded as interventions that could be introduced early in the development of mental instability, which could prevent a person from developing a chronic mental disorder and allowed the patient to recover while in the peaceful surroundings of home (Grob, 1991; Jennings & Hudak, 2010).

Consequently, state mental hospitals began closing, releasing thousands of psychiatric patients to the care of largely absent community mental health services now charged with the task of providing appropriate follow-up services to previously institutionalized individuals (Lurigio, Rollins, & Fallon, 2004; Sacks & Ries, 2006). In addition to the inability of community resources to provide long-term care for chronic mental disorders, mental health treatment services have been criticized for being highly compartmentalized and unwilling to serve clients with multiple disorders (Lurigio, Rollins, & Fallon, 2004). Individuals suffering from co-occurring substance dependence

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and mental disorder are most strongly affected by this bias due to their perceived tendency to resist efforts at treatment, particularly among substance abusers (Sacks & Ries, 2006), and because of the unwillingness of service providers to treat patients suffering from multiple ailments (Lurigio, Rollins, & Fallon, 2004).

Criminalization. A second development related to and encouraged by the process of deinstitutionalization is the increased use of the criminal justice process against mentally ill offenders. Referred to in mental health and justice literature as "criminalization" (Abramson, 1974; Laberge & Morin, 1995; Lurigio, Rollins, & Fallon, 2004), and sometimes as "transinstitutionalization" (Grob, 1991), the responsibility for the mentally disordered has shifted from state mental hospitals to prisons and jails through the concomitant influence of developments in mental health law that make placement in state hospitals much more difficult, and police practices that increase the likelihood of incarceration over service referral for mentally ill offenders.

Developments in mental health law largely succeeded in elucidating and strengthening the rights of mentally ill persons, with the most sweeping changes made during the 1970s as part of a broader movement toward improving civil liberties through state and Constitutional law protection (Wexler, 1992). Most importantly, legal restrictions were created to increase the difficulty of involuntary commission to psychiatric hospitals (Abramson, 1972; Lurigio, Rollins, & Fallon, 2004). The first piece of legislation to accomplish this was California's Lanterman-Petris-Short Act of 1969, which changed the criteria under which an involuntary commission could be effected. Prior to the passage of this law, involuntary commitment could be made if the individual presented a danger to self or others and was in need of hospitalization (Abramson, 1972).

Civil commitment under California law currently requires demonstration of clear and convincing evidence of danger to self or others, or of grave disability, by appropriate psychiatric personnel or a police officer, and an initial detention can last only 72 hours (California Welfare & Institutions Code §5150, 2011). Additionally, certain treatments may be refused such as pharmacotherapy (California Welfare & Institutions Code §5325.2, 2011) and psychosurgery (California Welfare & Institutions Code §5326.6, 2011). Under certain circumstances additional confinement may be warranted through extensions to the initial commitment period upon the demonstration of clear and convincing evidence of danger to self or others or grave disability. A 14-day extension may be applied if the danger presented is to self, as well as a 180 day extension if the person presents a danger to others. While these procedures are specific to California law, other states quickly followed California's lead by adopting similar legislation.

While these hearings are not criminal proceedings and serve the legitimate function of protecting the rights of mentally ill, the protections occasionally work against the best interests of mentally ill criminal offenders by subjugating the role of the medical system to the criminal justice system. This owes largely to a shift in perspective about the role of mental health law. As Wexler (1992) points out, mental health law in the era in which reforms such as the Lanterman-Petris-Short Act were instituted was principally used to determine the extent of Constitutional protections shared by both mentally ill and healthy criminal offenders, during which time deference was given to the medical field and the knowledge of psychiatrists. This has largely been supplanted by the use of mental health law as a tool to define the circumstances under which the offenders with mental disorders are considered criminally culpable; the creation of "guilty but insane" verdicts

and various restrictions placed upon insanity defenses all serve as efforts to define mental disorder as an issue within criminal justice (Wexler 1992). Explained another way, where mental health law reform in the earlier era sought to liberate, the current era seeks to restrict. Doctors are pitted against patients and attorneys during probable cause hearings to determine if a client can be held against his or her will, though the court's deference to the civil rights of the patient occasionally works against the patient's best interests. Courts do not consider critical factors such as diminished foresight that determine the stability of a person's mental state or the likelihood that a person may discontinue medication upon release. Consequently, a person in desperate need of intensive inpatient supervision may be allowed to discontinue treatment against the advice of psychiatrists and become a target of the criminal justice system when his or her disorder results in the commission of crime in the community (Quanbeck, Frye, & Altshuler, 2003). The mentally disordered are also more likely to be manipulated and victimized in the home community and to become criminal offenders (Drake & Wallach, 2000).

Another factor in which criminalization acts in concert with developments in mental health law is police response toward the mentally ill. Police are often the first, and occasionally the only, institutional agents to come into contact with a mentally ill person in the community. Police contact with mentally ill offenders is usually the result of a call for service by a citizen due to the behavior of the offender (Teplin, 2000) or the result of personal contact during an individual officer's routine patrol (Lamb & Bachrach, 2001). Response to incidents involving mentally ill persons is grounded in both the police power, the power to respond in the interest in public safety, and *parens patriae*, the power to intervene in the best interests and protection of a vulnerable person (Teplin,

2000). Pursuant to these two objectives, police are given the option to deal with incidents informally, arrest the individual causing the disturbance, or transport the person to a mental hospital for civil commission (Teplin, 2000).

The use of arrest is thought to contribute disproportionately to the population of mentally ill persons within jails and prisons, and as many of the works of Teplin (1990, 2000) and others have suggested, the use of arrest has effectively placed more mentally ill people in correctional settings than people without mental disorders. Several factors help explain this trend. The first is training and understanding of mental disorder among police officers who are more likely to interpret antisocial behavior by the mentally ill as criminal behavior (Quanbeck, Frye, & Altshuler, 2003). Police are also likely to underestimate the scope and prevalence of mental disorder because of lack of training (Husted, Charter, & Perrou, 1995), suggesting that police who encounter a disruptive mentally ill offender are less likely to place odd behavior in the larger context of mental health and more likely to use the power of arrest to resolve disputes with the mentally ill. This has been ameliorated with improvements in police training and response units for incidents involving mentally ill offenders. Jennings and Hudak (2010) discussed at length the impact of police training on response to calls for service and concluded that the improvements in training have significantly decreased the percentage of mentally ill people arrested to as low as 5% of arrests in one department.

Individuals with mental disorders are also placed in prisons and jails due to lack of available alternatives to imprisonment. While police may indeed use arrest disproportionately as a resolution tactic when dealing with the mentally ill, the reasoning for doing may be out of altruism and trust in the medical system that is unmet by the

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resources of community healthcare. The community's tolerance for crime committed by a mentally ill offender may be exhausted by the time police are called to the scene, and thus the police are forced to remove the person from the scene. By using the power of arrest, police may actually be deferring to the medical community's ability to treat and introduce stability in offenders' lives, and the justice system as a whole acts as an agency through which people are put in contact with needed services. The problem is that the community healthcare providers reject this responsibility by refusing to admit offenders who may be in the greatest need of help, such as violent or intoxicated offenders, and place the criminal justice system in charge of these people because it is seen as the most appropriate institution to deal with "dangerous" people (Laberge & Morin, 1995; Lamb, Weinberger, & DeCuir, 2002; Sigurdon, 2000). Additionally, police who make arrests during very late shifts may not have the ability to place mentally ill offenders in community healthcare settings because such services are not available, thus the offender must be confined in jail or else be released (Jennings & Hudak, 2010).

Influence on incarcerated populations. The cumulative result of deinstitutionalization and criminalization is the significantly expanded role of the criminal justice system as first point of contact for the mentally ill. Because the police are under pressure to use arrest in response to bring peace and community mental health systems are not equipped to deal with the influx of mentally ill offenders, the next logical resolution is to allow them to enter the criminal justice system as criminal defendants. This seems consistent with Morrissey and Goldman's (1986) process observation regarding psychiatric healthcare reform, as we are now in the midst of the "frustration and apathy" stage of new reform implementation that seems to conclude each cyclical

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reform period. While more inmates with mental disorder populate American prisons and

jails than in psychiatric hospitals (Sigurdson, 2000; Treatment Advocacy Center, 2010),

the influence of deinstitutionalization upon this trend can only be inferred because of the

lack of quality studies that compare prison populations before and after

deinstitutionalization came to fruition (Lamb & Bachrach, 2001). An unpublished

manuscript suggests the process of deinstitutionalization accounts for 28% to 86% of the

population of prison inmates suffering from mental disorder (Raphael, 2000).

Nonetheless, Lamb and Bachrach (2001) suggest this process is at least partially to blame

for the increase in prison populations, due to the very large increase in jail and prison

populations at the same time as the mass closing of state psychiatric hospitals, the lack of

availability of long-term hospitalization in the community healthcare system, and the

strong resemblance of the composition of current mentally ill prisoners in jails and

prisoners to those who had formerly been kept in psychiatric hospitals. The composition

of the "new generation" of mentally ill are also far more likely to be homeless (Lamb &

Bachrach, 2001; Sigurdson, 2000), are consequently less likely to have access to

community care, and are more likely to be contacted and arrested by police.

<div align="center">Cooccurring Disorder</div>

Correctional treatment is further confounded by the confluence of mental disorder

with substance abuse. This condition, referred to alternately as *co-morbidity, co-*

occurring disorder, and dual diagnosis, stymies efforts to diagnose and treat individuals

because it is more difficult to identify and treat than disorders that occur alone (Watkins,

Lewellen, & Barrett, 2001) and because service provision in both the general population

and within institutions is undermined by a schism between substance abuse and mental

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disorder treatment (Lurigio, Rollins, & Fallon, 2004). Co-occurring disorder often increases the likelihood of suffering from either a substance use disorder or a mental disorder alone. An influential and often cited study by Reiger et al. (1990) found that within people not diagnosed with a mental disorder the odds ratio of suffering from any drug disorder was 3.7, and that of suffering from an alcohol disorder was 11.0. These ratios for individuals diagnosed with mental disorders were 14.7 for any drug disorder, and 22.3 for any alcohol disorder. Additionally, the same study found higher odds ratios for suffering any mental disorder among people who suffered from a drug or an alcohol use disorder than among people who did not suffer any substance use disorders (Reiger et al., 1990). Within correctional populations, the percentage of comorbid individuals is often higher. A descriptive report from the 2004 Survey of Federal and State Inmates, the dataset used for the current analysis, found that 74% of state and 64% of federal prisoners report both drug dependence and mental disorder (James & Glaze, 2006). Prisoners in the sample were more likely to report dependence instead of abuse and more likely to report abuse of drugs other than alcohol as opposed to alcohol while diagnosed with a mental health problem (James & Glaze, 2006).

The conceptual development of comorbidity is difficult to accurately elucidate, but the identification of comorbidity in patients was encouraged by the same paradigm shift that brought deinstitutionalization to fruition. More specifically, it is derived from theorization between 1960 and 1990 that explained mental disorder as the product of interplay between biology, psychology, and society (Watkins, Lewellen, & Barrett, 2001). Exactly how these factors work together, and which factors precede others, is yet unclear and remains a strongly contested topic in psychiatric literature; especial focus is

placed upon whether mental disorder encourages maladaptive drug use or if drug use encourages development of mental disorders. Brain chemistry in a person diagnosed with mental disorder may be extremely sensitive to the effect of drugs such that drug use can trigger short-term psychotic episodes. A series of case studies by Aronson and Craig (1986) described the extreme effects of cocaine upon sufferers of panic disorders, all of whom suffered panic attacks months after beginning cocaine use despite the absence of panic attacks in the months before beginning drug use. Similarly, Jaffee et al. (2009) found that heavy alcohol use was strongly predictive of depressive episodes in a sample of individuals suffering from bipolar disorder.

The social vulnerability of the mentally ill has been repeatedly visited in psychiatric literature as a predictor for drug use. Inmates diagnosed with mental disorders are easily manipulated into committing crime on behalf of others when released from prison back into their home communities, and the increased opportunity to become involved in crime in the home community is an important factor in relapse of drug abuse symptoms and reincarceration (Lamb & Bachrach, 2001; Sigurdson, 2000), particularly because drug dependent individuals may commit crime in order to obtain drugs (Abramson, 1972). Conversely, mental disorder may encourage the use of drugs as a coping device for physical or emotional pain (Khantzian, 1985, 1997), with certain drugs such as opiates and alcohol used to ameliorate the effects of depression or mania (Suh, Ruffins, Robins, Albanese, & Khantzian, 2008). The use of drugs as a coping mechanism was a significant factor for drug use among a sample of federal prisoners within a drug treatment program, with emotional pain being cited by participants as a type of pain that prompted drug use (Langan & Pelissier, 2001).

Accurate diagnosis of comorbid disorders is difficult due to the interplay of mental disorder and substance abuse. Distinguishing whether the person suffers from the effects of chemical withdrawal, mental disorder alone, or a combination of the two is a delicate process with serious consequences for error. Underdiagnosis occurs when an individual is treated only for what appears to be the primary disorder when two disorders are at work. Chemical dependency diagnoses may miss latent mental disorder while undertrained psychiatrists may miss signs of chemical dependency (American Psychiatric Association, 2000; Gorski, 1994). Overdiagnosis occurs when an individual is treated for two disorders when only one is actually present. A person in early recovery from chemical withdrawal may exhibit symptoms that mimic a co-occurring disorder (Gorski, 1994), and while treating chemical dependency with drugs is accepted practice (American Psychiatric Association, 2000), pharmacotherapy is approached with trepidation because unnecessary drug use can create a separate disorder that will not respond to treatment (Gorski, 1994).

Another issue with co-occurring disorder is the influence of barriers to care of people with co-occurring disorder (Peters & Hills, 1997). Substance abuse and mental health treatment are separated by different research agencies, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the National Institute on Drug Abuse (NIDA), which helped to encourage competition and isolation between the two treatment processes (Peters & Hills, 1997). Economic separation also influences treatment modality as the two agencies draw funding from different sources. Thus, comingling of funds and treatment research does not readily happen, and treatment of co-occurring disorder suffers for it. Another issue is lack of institutional support for convicted offenders who

require rehabilitative services. The mentally ill, particularly those who are addicted to drugs, lack the economic or self-control resources to provide adequate self-care (Hoge, 2007) or else are turned away from community healthcare settings due to the stigma of a criminal conviction on top of suffering from co-occurring disorder (Hoge, 2007; Peters & Hills, 1997). Additionally, substance abusers are occasionally refused treatment by mental health settings due to their drug use habits (Sacks & Ries, 2006). Because treatment is difficult for sufferers of co-occurring disorder to secure, the end result is the reincarceration of comorbid offenders. Comorbid offenders are at substantially higher risk of reincarceration than offenders who suffer from one or fewer such disabilities (Baillargeon et al., 2009), are often incarcerated more than once (James & Glaze, 2006), and are highly likely to return to prison within 1 year of release (Lurigio, Rollins, & Fallon, 2004).

<p style="text-align:center;">Theoretical Basis for Study</p>

The current study was conducted to explain the prevalence of co-occurring substance abuse and mental disorder among prisoners through application of the self-medication hypothesis (Khantzian, 1985, 1997, 2005). This theory explains co-occurring disorder as a product of a partially successful attempt to alleviate emotional pain with the use of drugs, both illegal and prescription, such as the use of alcohol to alleviate anxiety (Schneider et al., 2001). Critical characteristics of maladaptive substance use identified by Khantzian (1995, 1997), whose work focused upon self-medication, are the use of drugs to ameliorate unbearable emotional affect or to induce favorable emotional state; the preference for a particular drug based upon its ability to bring about a desired emotional state; the inner state of the drug users; and accessibility of the drug.

Amelioration of Emotional Pain

Substance users either attempt to ease emotional pain or perpetually pursue a pleasant mood not otherwise obtainable. This helps explain the high incidence of substance abuse among prisoners who have suffered previous sexual or physical assault (Langan & Pelissier, 2001), among female inmates, who are more likely to report histories of abuse and assault than men (Peters, Strozier, Murrin, & Kearns, 1997) as well as analgesic use of drugs and alcohol (Suh, Ruffins, Robins, Albanese, & Khantzian, 2008).

Preference for Specific Drugs and Inner State

Self-medication is predicated upon the utility of certain drugs to relieve specific ailments. This depends upon the action of the drug; the influence of alcohol, stimulants, and other drugs in particular are often considered, as is the emotional state of the user. Khantzian's (1985, 1997) patients used opiates to dispel anger and soothe violent affect, depressants and alcohol to relax tense states, reduce feelings of isolation, and release inhibitions, and stimulants to boost energy whenever tired or bored. Substance abuse also depends in some measure upon the ailment suffered by the abuser. Khantzian (1997) described the case of a schizophrenic patient in his care who normally did not associate with others but became very talkative after using alcohol. Among a cohort of participants of vocational training for low-income adults, almost 70% reported abuse of either alcohol, cocaine, or heroin before they entered the program. Alcohol was favored for its ability to repress feelings of depression, while cocaine was favored for its ability to bring about feelings of elation and happiness in the user (Suh, Ruffins, Robins, Albanese, & Khantzian, 2008). A German study of alcohol dependent patients remained inconclusive

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about the cause of co-occurring disorder but suggested stress disorders and anxiety encourage the alcohol abuse as a coping mechanism with over 42% of the sample suffering from co-occurrence of stress disorders and alcohol dependence (Schneider et al, 2001). Finally, the personality of the individual also influences substance preference. Aggressive individuals may avoid alcohol because of perceived loss of self-control but may find opiates more soothing (Khantzian, 1997).

Cost and Availability of Drug

Access to drugs is a necessary element of self-medication. Even if a genetic predisposition to substance dependence is passed down from a parent to a child, dependence cannot develop if the person cannot acquire a drug to use (Gelernter & Kranzler, 2008). Once drug dependence has begun, preference for a drug may be a consequence of price and availability as a preferred drug may be prohibitively expensive or otherwise inaccessible. This is particularly true with alcohol, whose users are sensitive to changes in the price of alcoholic beverages, and strategic use of taxation, price adjustment, and retail availability are suggested tactics by the World Health Organization (2010) to reduce harmful alcohol use in communities. Users may also respond to unavailability of one drug by modifying the dose of other drugs to approximate the effects of a desired yet unavailable drug. Alcohol in low or moderate doses can approximate a small dose of cocaine, while large doses of alcohol are closer in effect to opiates (Khantzian, 1997).

Weaknesses of Theory

Criticisms of the self-medication hypothesis have questioned the temporal order of substance abuse and mental disorders suggested by the theory (Mueser, Drake, &

Wallach, 1998), have dismissed the significance of the relationship between the two disorders (Brunette, Mueser, Xie, & Drake, 1997; Mueser, Drake & Wallach, 1998; Schuckit & Monteiro, 2006), or suggest the relationship is not consistent with self-medication (Schuckit & Monteiro, 2006; Williams, 1966).

Self-medication assumes that mental disorder is already present in the individual and is the impetus for substance abuse. This can be difficult to substantiate as establishing the true direction of relationship in comorbid individuals remains a contentious issue in the literature, with some studies suggesting the relationship between substance abuse and mental disorder is the opposite of what is suggested by the hypothesis or indeterminable (Mueser, Drake, & Wallach, 1998). Furthermore, some authors contend that the evidence for self-medication is weak, inconsistent, or insufficient. Brunette, Mueser, Xie, and Drake (1997) attempted to determine if self-medication explained alcohol, cannabis, and other drug use in a sample of 172 patients diagnosed with schizophrenia and found either weak or no evidence of correlation between the patients' symptoms and their drug use. Mueser, Drake, and Wallach (1998) concluded after a review of the extant co-occurring disorder literature that more evidence was needed to conclusively determine patients chose certain substances for their therapeutic effects and that these substance were indeed being used, before self-medication could be inferred. With regard to the therapeutic value of certain substances, the authors found that some studies suggested substance use resulted in antitherapeutic effects, such as increased aggression with the use of alcohol, while others could not conclusively report a relationship between substance use and emotional state. Finally, the relationship between substance abuse and mental disorder may indeed exist, though drug

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use is not necessarily analgesic. An individual does not consciously medicate objective

psychiatric states but rather subjective states of being; an individual who drinks when

feeling sad may not necessarily do so to medicate depressive disorder (Schuckit &

Monteiro, 2006). Furthermore, substance use can exacerbate negative states of being. A

survey of 119 cannabis-addicted individuals diagnosed with major depressive disorder

found that cannabis use was not the result of self-medication, and users felt higher levels

of depression and anxiety and lower levels of happiness following cannabis use (Arendt

et al., 2007). Alcohol potentially lowers inhibitions at low doses but exacerbates anxiety

and depression at higher doses (Schuckit & Monteiro, 2006; Williams, 1966).

The preceding criticisms notwithstanding, self-medication is an appealing

theoretical basis for the current study due to the high likelihood that prison inmates

experienced considerable emotional suffering in life before entering prison and because

self-medication has been reported as a reason for drug use among prisoners undergoing

correctional treatment for substance use disorders (Langan & Pelissier, 2001). The

current dataset allows an opportunity to test this hypothesis using a large and

geographically diverse sample of prison inmates.

Summary

Overall, prison populations are seeing an increase in the percentage of drug-

dependent and mentally disordered offenders. This is partially explained by justice and

healthcare policies that attempt to protect individuals with substance abuse and mental

disorders yet make their adjudication for minor crimes more likely when compared to

individuals without these factors who commit similar crimes (Teplin, 1990). It is also

thought that the net-widening that has enmeshed more offenders with these individual

disorders has increased the percentage of prisoners with co-occurrence of mental disorders and substance abuse disorders, though studies that have attempted to determine this in the past have been limited to cohorts within individual states. The current study is an attempt to determine the prevalence of co-occurring disorder using a nationally representative sample of state and federal prisoners. It is expected that a statistically significant proportion of the sample will exhibit signs of co-occurring disorder, and that a significant percentage of substance abuse and dependence will be explained by mental disorders, consistent with the analgesic use of drugs and alcohol in the face of serious emotional or affective disorder.

CHAPTER 3

METHODS

The present study was conducted to determine the extent to which mental illness

correlates with maladaptive use and dependence upon alcohol and drugs using the Survey

of Inmates in State and Federal Correctional Facilities 2004. Descriptive statistics are

used to describe the sample, the prevalence of various mental disorders within the

sample, and the signs of maladaptive drug and alcohol use in the year before

incarceration. Multivariate analyses are used to measure the extent of the influence of

alcohol and other drug abuse and dependence upon mental disorders in the sample after

controlling simultaneously for the effects of prison environment, sex, and monthly

income.

Data

The data for the current study are the 2004 Survey of Inmates in State and Federal

Correctional Facilities collected by the Bureau of the Census for the Bureau of Justice

Statistics and made publicly available by the National Archive of Criminal Justice Data.

Sampling

Data were collected using a two-part cluster sampling system. The first stage of

sampling selected the institutions, and the second stage selected the inmates who

participated in the survey.

Stage 1 - prison sampling. Sampling frames from which prisons were selected

were created by separating state prison populations by sex. Prisons with both male and

female inmates were listed under both the male and female groups. Prisons with

advanced medical care facilities such as mental health or geriatric care were selected with

certainty, as were prisons with male populations greater than 1,500 inmates or female populations of 750 inmates. The remaining prisons in the sampling frame were stratified and selected within the following geographical groups: Northeast, excluding New York; New York; Midwest; South, excluding Florida and Texas; Florida; Texas; West, excluding California; and California. The sampling resulted in 211 male prisons and 58 female prisons. A supplemental sample was taken from prisons that opened after the completion of the initial survey, consisting of 27 male prisons and 2 female prisons. Federal prisons were stratified by security level. Prisons with female populations were classified as "minimum security" and "all other security," whereas male prisons were classified as "administrative security," "high security," "medium security," "low security" and "minimum security." Among the prisons selected in this stage, 10.88% of state prisons and 15.38% of federal prisons did not participate in the study.

Stage 2 – inmate sampling. Inmates were randomly selected within the selected prisons from master lists. State prisoner lists were provided to the surveyors by the respective facilities, while researchers from the Federal Bureau of Prisons selected prisoners from a central list and notified each prison 5 to 7 days prior to the beginning of interviews. Within the sampling frames drawn from the prisoner lists, 1 in 85 males and 1 in 24 females in state prisons were selected for interview, resulting in a total of 14,499 completed interviews of state inmates, and 1 in 32 males and 1 in 9 females in federal prisons were selected for interview, resulting in 3,686 completed interviews of federal prison inmates. Of the inmates selected at this stage, 10.23% of state inmates and 13.33% of federal prisoners refused to participate in the survey.

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Inmates who participated in the survey were given oral and written notice that participation in the survey was voluntary, that responses were confidential, and respondents and their data would not be identified. The data collection instrument was a computer-assisted survey, administered for approximately 1 hour, that provided questions to participants without input from the interviewer.

Variables

The 2004 Survey of Inmates in State and Federal Prisons included many measures of the inmate's use of drugs and alcohol as well as previous diagnosis of mental disorder. An extensive study of respondents' history of use of several types of drugs was possible, though the current analysis was limited to the respondent's use of drugs in the year before admission to the prison in which he or she resided at the time of the survey. Additionally, the analysis of mental disorder is limited to measures of diagnosis by a mental health professional of certain disorders in the respondent's entire life. Although the survey included measures of individual symptoms of mental disorders such as whether the respondent heard voices that others did not, the data were not comprehensive enough to combine into a comprehensive variable. Additionally, diagnosis by a psychologist was considered a more stable measure of mental disorders than self-report. A detailed description of the variables used for analysis is provided below, and the survey questions for each variable are reproduced in the Appendix.

Mental Disorders Measures

The 2004 Survey included a section dedicated to reports of medical conditions and mental health expanded from previous iterations and asked several questions about

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the respondent's mental health history. Respondents were asked whether they have ever been diagnosed with a mental disorder by a mental health professional, with seven specific disorders included in the survey. The analysis considered (1) major depression, (2) bipolar disorder, (3) schizophrenia or another psychotic disorder, (4) posttraumatic stress disorder or (5) other anxiety disorders such as panic disorder, (6) personality disorders, and (7) any other mental or emotional condition. Responses to these questions were either "yes," "no," or "don't know." These responses were coded 1 for yes, 2 for no, and 7 for don't know in the original dataset, and recoded 0 for no, 1 for yes, and 9 for don't know in the current analysis.

The mental health variables were summed to compute a composite variable titled "Mentalill," which was used for linear regression analysis. This was done to avoid the pitfall of relying upon a single variable to represent the complexity of mental disorder. A reliability analysis was conducted upon the variables to determine the internal consistency of the measure. This measure, known as Cronbach's Alpha or α, ranges from 0 to 1. Higher values indicate stronger internal consistency, with the accepted threshold being .70. Alpha for the "Mental" variable was .725, indicating sufficient internal consistency for use as a variable, though the reliability model suggested this value could be improved by removing the measure "Ever diagnosed with other mental or emotional condition" from the final model. This measure was removed, which yielded an alpha level of .741. Additionally, the measure "ever diagnosed with a personality disorder" was also removed from the "Mentalill" measure. Although this weakens the internal consistency of the model to .714, an important conceptual consideration with regard to co-occurring disorder supersedes the inclusion of personality disorders in the model.

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Mental disorders are diagnosed along what is known as a multi-axial system that gathers

diagnostic information from different "domains." (American Psychiatric Association,

2000). These domains are clinical disorders, personality disorders, general medical

conditions, psychosocial and environmental problems, and global assessment of

functioning; these are labeled Axis I through Axis V, respectively (American Psychiatric

Association, 2000). Some definitions of cooccurring disorder (Baillargeon et al., 2009)

allow only the inclusion of co-occurring Axis I disorders, whereas others (Watkins,

Lewellen, & Barrett, 2001) use both Axis I and Axis II disorders as disorders. The precise

definition of "cooccurring disorder" is critical in analysis because the inappropriate

inclusion of Axis II diagnoses may inflate the estimate of mentally disordered inmates

and distort the results of the model. The analysis used a conservative definition of

cooccurring disorder by excluding personality disorder sufferers from the "Mentalill"

construct and later analyses. Consistent with the recoded values of the constituent

measures, higher values on the "Mentalill" variable indicated stronger influence of

mental disorders.

Substance Use Measures

Based on past research and theoretical importance, a number of variables were

selected as independent variables to determine their relationship to mental disorder. This

study specifically examined the relationship between maladaptive substance use and

mental disorder. "Abuse" and "dependence" are distinguished in the following section, as

the two terms describe different mechanisms of substance use. Additionally, alcohol use

is distinguished from substance use because fewer barriers exist in the acquisition of

alcohol than with other drugs. While alcohol can be purchased at any authorized

distributer without the need for special relationships as a prerequisite for purchase, other drugs are acquired only through a special acquaintance that is willing and able to provide access to drugs. Legally, drugs may be obtained through prescription, which requires a valid notice of prescription from a doctor and a pharmacy that is able to fill the request. Illegal drugs also require a special relationship, though more means of access are available to the purchase: theft, purchase from a dealer, or through a gift by friend. All of these means require that the person know someone who possesses drugs, theft requires the skill to successfully perform the theft of the drug, sale requires that the person know someone who is willing and able to sell to the individual, and gifting requires that the user know someone who is willing to provide access to drugs with no compensation or in exchange for favors such as criminal activity.

 Substance abuse. Maladaptive use of illegal or prescription substances was measured across nine items identified in the DSM-IV TR (2000) as indicators of substance abuse. Respondents were asked if they had, in the year before incarceration, experienced any of the following: (1) arguments with a spouse, significant other, or family member while under the influence of drugs; (2) physical fights with others while drinking or soon after drinking; (3) arrest or detention at a police station because of drug use; (4) dangerous actions committed under the influence of drugs such as walking in a dangerous area or other situations that increased the respondent's chances of getting hurt; (5) job loss due to drug use; (6) school or job trouble such as missing too much work or school or poor work output due to drug use; or (7) inability to do work, go to school, or care for children due to drug use. Respondents were also asked if, in their entire lives, they had encountered the following: (8) an accident while under the influence of drugs, or

(9) operation of a motor vehicle while under the influence of drugs. Each of these measures was coded 1 for "yes," 2 for "no," and 7 for "don't know." These were recoded such that "no" equals 0, "yes" equals 1, and "don't know" equals 9.

As with the mental disorder measures, single measures of drug abuse could not capture the gestalt of drug use. Thus, a variable was created by summing some of the drug abuse measures. Reliability analysis indicated sufficient internal consistency among the measures for creation of a composite variable ($\alpha = .798$), though the model suggested internal consistency could be improved by removing the "accident while under influence" and "operated a motor vehicle under influence" measures. These measures were excluded from the constructed variable "DrugAbuse," which increased Cronbach's α to .844.

Substance dependence. Chronic drug-seeking or chemical addiction was measured across 10 items, based upon criteria of substance dependence identified in the DSM-IV TR (2000). Respondents were asked if in the year before their current sentence they had experienced the following: (1) sacrifice of important or interesting activities in favor of using or acquiring drugs; (2) persistent drug use despite problems with relationships or work caused by use; (3) use of drugs for a longer period of time or in larger quantities than intended; (4) spending a great deal of time obtaining drugs or recovering from the ill effects of use; (5) withdrawal symptoms upon cutting down or stopping use; (6) continued drug use despite emotional or psychological problems caused by drug use; (7) continued drug use despite medical or health problems caused by use; (8) unsuccessful attempts to cut down or stop drug use on more than one occasion; (9) increased use of drugs to delay or mitigate the symptoms of a hangover; and (10) failure to achieve the desired effect from a usual dose of drugs. Each of these variables was

coded 1 for "yes," 2 for "no," and 7 for "don't know." These were recoded to 0 = "no," 1 = "yes," and 9 = "don't know." A composite variable "DrugDepend" was created by summing all 10 of the dependence measures. Reliability analysis indicated a strongly internally consistent measure (α = .951) with no omissions suggested, thus all dependence measures were included. Consistent with the recoded values, higher values for "DrugDepend" indicate a stronger degree of illegal and prescription drug dependence.

Alcohol abuse. Maladaptive use of alcohol is measured across nine items derived from the DSM-IV TR (2000) description of alcohol abuse, in similar form to those used for substance abuse. Respondents were asked if they had in the year before incarceration (1) experienced arguments with a spouse, significant other, or family member while under the influence of alcohol; (2) physical fights with others while drinking or soon after drinking; (3) arrest or detention at a police station because of alcohol use; (4) dangerous actions committed under the influence of alcohol such as walking in a dangerous area or other situations that increased the respondent's chances of getting hurt; (5) job loss due to alcohol use; (6) school or job trouble such as missing too much work or school or poor work output due to alcohol use; (7) or inability to do work, go to school, or care for children due to alcohol use. Respondents were also asked if in their entire lives they had experienced the following: (8) an accident while under the influence of alcohol, or (9) operation of a motor vehicle while under the influence of alcohol. Each of these measures was coded 1 for "yes," 2 for "no," and 7 for "don't know." These were recoded such that "no" equals 0, "yes" equals 1, and "don't know" equals 9.

A composite variable labeled "AlcAbuse" was created by summing seven of the nine measures. When all nine measures were included, a moderate degree of internal

consistency (α = .768) was observed, which was improved (α = .844) by the omission of the "accident while under the influence" and "operated a motor vehicle" measures. Consistent with the recoded values of the constituent measures, higher values of "AlcAbuse" indicate stronger levels of alcohol abuse.

Alcohol dependence. Compulsive use of alcohol was measured across 10 items identical in scope and language to the substance dependence measures, and grounded in the DSM-IV TR (2000) criteria for alcohol dependence. Respondents were asked if, in the year before their current sentence, they had experienced the following: (1) sacrifice of important or interesting activities in favor of using or acquiring alcohol; (2) persistent alcohol use despite problems with relationships or work caused by use; (3) use of alcohol for a longer period of time or in larger quantities than intended; (4) spending a great deal of time obtaining alcohol or recovering from the ill effects of use; (5) withdrawal symptoms upon cutting down or stopping alcohol use; (6) continued use despite emotional or psychological problems caused by alcohol use; (7) continued alcohol use despite medical or health problems caused by use; (8) unsuccessful attempts to cut down or stop alcohol use on more than one occasion; (9) increased use of alcohol to delay or mitigate the symptoms of a hangover; and (10) failure to achieve the desired effect from a usual dose of alcohol. Each of these variables was coded 1 for "yes," 2 for "no," and 7 for "don't know." These were recoded to 0 = "no," 1 = "yes," and 9 = "don't know." A composite variable "AlcDependence" was created by summing all 10 of the dependence measures. Reliability analysis indicated a strongly internally consistent measure (α = .931) with no omissions suggested, thus all dependence measures were included.

Consistent with the recoded values, higher values for "AlcDependence" indicate a stronger degree of alcohol dependence.

Separating abuse from dependence. "Abuse" and "dependence" were distinguished in the DSM-IV TR (2000) and in the current analysis. "Abuse" describes a pattern of use that does not involve tolerance, withdrawal, or compulsive use and seeking behavior but in which the user repeatedly over a period of 12 months fails to fulfill obligations or behaves dangerously due to drug use. "Dependence" is the occurrence of three or more of the symptoms described above within a 12-month period and also results in withdrawal, tolerance, and compulsive use of substances that interferes with other activities (American Psychiatric Association, 2000). By creating composite variables from the sums of separate measures, the intended measurements are inflated due to redundancy. Because dependence theoretically is stronger in degree than abuse, due to the tolerance and craving for drugs added to the use of drugs as a coping device, the two phenomena were separated by excluding abuse from dependence; a respondent that loads positive as substance dependent will not load as a substance abuser as well. Separate variables were created to reflect this, labeled "AlcAbuse2" and DrugAbuse2," though the original metrics of the constructed variables remained intact.

Demographic variables. Several demographic characteristics were included as control variables in the multivariate model. These include "Male" (coded 1 for yes, 0 for no), "State" (whether the inmate is incarcerated in a state prison, coded 1 for yes, 0 for no), and White2 (a recode of an extant variable "White" in the dataset, coded to 1 for yes, 0 for no). Respondents' monthly income is included and is measured ordinally from 0 (no income) to 12 ($7,500 or more). Although ordinal measures violate the assumption of

linear regression analysis, the values between categories are sufficiently continuous to warrant use in a multivariate model. Finally, the variable "parabuse" (coded 1 for yes, 0 for no) was created to measure whether parents or guardians abused alcohol and drugs while the respondent was growing up. This measure is identified as particularly important in determining an individual's substance abuse and accounts for between 40% to 60% of the variation in risk of alcohol dependence (American Psychiatric Association, 2000).

<p style="text-align: center;"><u>Hypotheses</u></p>

The goal of this study was to determine the degree to which mental disorder and substance abuse were related in a nationally representative sample of prison inmates. Several hypotheses suggested by prior research and theoretical concerns guided the analysis:

H1: Substance abuse is positively related to mental disorder.

H2: Substance dependence is positively related to mental disorder.

H3: Alcohol abuse is positively related to mental disorder.

H4: Alcohol dependence is positively related to mental disorder.

H5: Alcohol abuse will share a stronger relationship with mental disorder than will substance abuse.

H6: Alcohol dependence will share a stronger relationship with mental disorder than will substance dependence.

H7: Alcohol dependence will share a stronger relationship with mental disorder than will alcohol abuse.

H8: Drug dependence will share a stronger relationship with mental disorder than will drug abuse.

<u>Analysis</u>

The purpose of this study was to use the Statistical Package for the Social Sciences (SPSS) to determine the degree to which mental disorder and substance abuse are related in a nationally representative sample of prison inmates. Analysis took place over two stages. Univariate statistics were calculated to determine the percentage of the sample diagnosed with various mental disorders as well as with psychiatrically determined indicators of maladaptive substance use. Composite variables were then constructed for the constructs of mental disorders and abuse and dependence upon alcohol and drugs. Finally, linear regression analysis was performed using a composite mental disorder variable and composite substance abuse variables to determine the strength and relationship that mental disorder and substance abuse share.

CHAPTER 4

RESULTS

The present study was conducted to determine the relationship between mental

disorders and maladaptive substance use. Several tests were ran to determine the

existence and strength of this potential relationship while controlling for other factors

suggested in previous research. Descriptive statistics were used to describe the

demographics, mental health, and substance use characteristics of the sample.

Multivariate statistics were then used to elucidate the relationships between mental

disorders and maladaptive substance use after controlling for other potential confounding

variables.

<u>Descriptive Statistics</u>

<u>Sample Demographics</u>

Table 1 shows a breakdown of the sample demographics. Male inmates

constituted 78.6% of the sample, 49.1% were white, and the majority of respondents were

housed within state correctional facilities (79.7%). Reported monthly income was almost

evenly distributed among the sample, with most respondents reporting at least $1,200 a

month (48.1%). Over two thirds of the sample (67.2%) reported that parents or guardians

had not abused drugs or alcohol while they were growing up.

<u>Mental Disorders</u>

Table 2 lists the percentage of the sample diagnosed by a mental health

professional with various mental disorders in their lifetime.

Table 1

Sample Demographics

Sex	Variable	Frequency	Percent
	Male	14,297	78.6
	Female	3,888	21.4
	Total	18,185	100.0
Race	Variable	Frequency	Percent
	White	8,931	49.1
	Non-white	9,850	54.3
Prison	Variable	Frequency	Percent
	State	14,499	79.7
	Federal	3,686	20.3
Monthly Income	Variable	Frequency	Percent
	No income	344	2.2
	$1-199	592	3.7
	$200-399	1,181	7.4
	$400-599	1,444	9.1
	$600-799	1,116	7.0
	$800-999	1,222	7.7
	$1,000-1,199	1,439	9.0
	$1,200-1,499	1,562	9.8
	$1,500-1,999	1,363	8.6
	$2,000-2,499	1,278	8.0
	$2,500-4,999	1,565	9.8
	$5,000-7,499	716	4.5
	Over $7,500	1,171	7.4
Parents abused alcohol & drugs	Variable	Frequency	Percent
	Yes	5,871	32.8
	No	12,005	67.2

Table 2

Diagnosis of Mental Disorders Within Sample

Mental disorder	Variable	Frequency	Percent
	Depression	3,651	20.4
	Bi-polar	1,911	10.7
	Schizophrenia	775	4.3
	PTSD	1,153	6.5
	Anxiety	1,449	8.1

Over 20% of the sample reported a diagnosis of major depressive disorder within

their lifetime, making it the most common diagnosis among the sample. Over 10% were

diagnosed with a bi-polar disorder, while less than 10% were diagnosed with

Schizophrenia (4.3%), posttraumatic stress disorder (6.5%), and anxiety disorders (8.1%).

Consistent with previous research, the prevalence of mental disorder diagnoses among

prisoners is higher compared to that of the public (Fazel & Danesh, 2002). Compared to

the general public, the diagnosis of these mental disorders within the sample is high.

Lifetime risk of major depressive disorder among women in the public varies from 10%

to 25%, and 5% to 12% in men (American Psychiatric Association, 2000). Lifetime

prevalence of bipolar disorders also varies; bipolar I is believed to be in between 0.4% to

1.6% of the population at large, and bipolar II disorder is believed to be in between 0.4%

up to 5% (American Psychiatric Association, 2000). Among the myriad psychotic

disorders that constituted the "Schizophrenia and other psychotic disorder" category in

the survey and the DSM-IV TR, lifetime prevalence for a psychotic disorder peaks at

1.5% for Schizophrenia but is as high as 40% for psychotic disorders resulting from a

general medical condition (American Psychiatric Association, 2000). Lifetime prevalence

of posttraumatic stress disorder among adults is approximately 8%, while the lifetime

prevalence of other anxiety disorders within the community varies from a peak of 3.5% for panic disorders to a peak of 33% for acute stress disorder (American Psychiatric Association, 2000).

Alcohol Abuse and Dependence Consequences

Table 3 lists the percentage of the sample that reported suffering from consequences of alcohol abuse and dependence as defined by the DSM-IV TR (2000). Among those respondents that reported symptoms of alcohol abuse, the most frequently reported problem was becoming involved in a dangerous situation (i.e: driving a car or walking in heavy traffic), following alcohol use (46.8%), followed by arguments with the respondent's spouse or significant other due to alcohol use (46.4%). Symptoms of alcohol dependence were reported in at least 21% of the sample. Nearly 27% of respondents reported arrest or detention at a police station due to alcohol use. The most commonly reported symptom of alcohol dependence was unintentional overuse of alcohol (40.2%), while the least commonly reported behavior was use despite trouble with family or friends (21.1%). Symptoms of self-medication were reported by at least 21% of the sample, encompassing use of alcohol despite its destruction of the respondent's relationship with others (21.1%), and emotional (34%) or overall health (27.5%). These three behaviors are of greatest interest because the use of alcohol *despite* these troubles may also be interpreted as use of alcohol *because* of these problems, which would undoubtedly create the sort of unpleasant mental state that a habitual alcohol user would hope to escape.

Table 3

Consequences of Alcohol Abuse and Dependence in Sample

Alcohol abuse	Variable	Frequency	Percent
	Arguments with spouse	5,099	46.4
	Arrested/detained	2,958	26.9
	Got into fights under influence	4,196	38.2
	Dangerous situation	5,143	46.8
	Lost a job	1,262	11.5
	School/job trouble	1,804	16.4
	Use stopped important activities	1,956	17.8
Alcohol dependence	Variable	Frequency	Percent
	Gave up activities for alcohol	2,566	23.4
	Use despite relationship trouble	3,833	21.1
	Used larger amount than intended	4,410	40.2
	Spent long time getting drugs	3,390	30.9
	Used to stall hangover	2,817	25.7
	Withdrawal following decreased use	2,550	23.3
	Use despite emotional problem	3,723	34.0
	Use despite medical problem	3,009	27.5
	Continued failure to stop alcohol use	3,423	31.2
	Tolerance of usual dose	3,793	34.8

Drug Use and Dependence Consequences

Table 4 lists the percentage of the sample that reported consequences of drug abuse and dependence as defined by the DSM-IV TR (2000). Among respondents that reported symptoms of drug abuse, the most frequently reported symptom was arguments with a spouse or significant other (41%), followed by involvement in a dangerous situation (i.e.: operation or a motor vehicle or walking in heavy traffic) after use of drugs (40.9%). Nearly 22% of respondents reported arrest or detention at a police station due to drug use. Symptoms of drug dependence were reported in at least 29% of respondents; the plurality of respondents reported use of drugs despite relationship trouble (41%), while the least commonly reported symptom was continued use of drugs to stall the effect of a hangover (29.4%). Self-medication was inferred from respondents who reported using drugs despite the problems drug use created with relationships (41%) and emotional (40.4%) or general health (35.3%).

<div align="center">Multivariate Statistics</div>

Linear regression analysis was used to determine the existence of a relationship between mental disorder and maladaptive substance use and to elucidate the strength and direction of the relationship. Table 5 shows the results of a regression of mental disorders upon alcohol abuse and dependence, drug abuse and dependence, sex, race, prison environment, monthly income, and family member abuse of drugs. Overall, the independent variables shared a significant association with the dependent variable ($F = 105.257$; $P \leq .000$), and the independent variables explained 10.3% of the variation in mental disorder. The low VIF and high tolerance of the variables confirmed that the model's validity was not significantly threatened by multicollinearity.

Table 4

Consequences of Drug Abuse and Dependence in Sample

Drug abuse	Variable	Frequency	Percent
	Arguments with spouse	5,959	41.0
	Arrested/detained	3,958	21.8
	Got into fights under influence	4,178	28.8
	Dangerous situation	5,945	40.9
	Lost a job	2,475	17.0
	School/job trouble	3,163	21.8
	Use stopped important activities	3,466	23.9
Drug dependence	Variable	Frequency	Percent
	Gave up activities for drugs	4,727	32.6
	Use despite relationship trouble	5,944	41.0
	Used larger amount than intended	5,738	39.6
	Spent long time getting drugs	5,302	36.6
	Used to stall hangover	4,260	29.4
	Withdrawal following decreased use	4,467	30.8
	Use despite emotional problem	5,861	40.4
	Use despite medical problem	5,112	35.3
	Continued failure to stop drug use	5,745	39.6
	Tolerance of usual dose	5,917	40.9

Table 5

Linear Regression Model 1

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tol.	VIF
(Constant)	.623	.134		4.664	.000		
AlcAbuse2	-.013	.081	-.002	-.158	.874	.989	1.011
AlcDependence	.028	.004	.084	7.239	.000	.810	1.235
DrugAbuse2	.067	.101	.007	.665	.506	.990	1.011
DrugDepend	.022	.004	.074	6.325	.000	.794	1.259
Male	-.625	.034	-.198	-18.462	.000	.953	1.049
State prison inmate	.185	.034	.058	5.508	.000	.976	1.025
White	.237	.026	.098	9.172	.000	.969	1.032
Monthly income in month before arrest	-.009	.004	-.026	-2.393	.017	.962	1.040
Parents abused alcohol or drugs	.230	.027	.093	8.613	.000	.948	1.055

Dependent variable: Mental disorders measure $R^2 = .104$ Adjusted $R^2 = .103$ $p \leq .000$

Nearly all of the remaining variables were significant at $p \leq .001$, save monthly

income in the month before arrest which was significant at $p \leq .05$. Neither drug nor

alcohol abuse shared a statistically significant relationship with mental disorders. Alcohol

and drug dependence shared positive although weak relationships with mental disorder.

Thus, the likelihood of a diagnosis of mental disorder by a trained mental health

professional increased when respondents self-reported drug or alcohol dependence. The

relationship between drug dependence ($B = .074$) and mental disorder was weaker than

that for alcohol dependence ($B = .084$), suggesting that a co-occurring mental disorder

was more likely among alcohol-dependent inmates than among drug-dependent inmates.

Sex shared the strongest relationship with mental disorder and suggested that females

were more likely than males to have been diagnosed with a mental disorder ($B = -.198$).

Family history with drugs and alcohol was also positively related to mental disorder, with

children of alcohol and drug abusing parents more likely to report a diagnosis of mental

disorder in their lifetimes ($B = .093$). Weak relationships were also found between prison

type and monthly income, with diagnosis of mental disorder more likely among state prison inmates (B = .058) and inmates with lower monthly income (B = -.026).

To further distinguish the relationship between mental disorder diagnosis and maladaptive substance use, models were constructed using the alcohol and drug abuse and dependence measures as dependent variables, and race, sex, monthly income, prison type, and mental disorder independent variables. Where the previous models were constructed to explain mental illness, these models were constructed to explain substance use and to determine if negative mental states lead to use of drugs and alcohol as a coping mechanism as Khantzian (1985) suggested. Unfortunately, lack of statistical significance in both the alcohol abuse (F = .830; P ≤ .547) and drug abuse (F = 1.763; P ≤ .103) models critically weakened their validity. This is consistent with the previous absence of a relationship between substance abuse and mental disorder in the previous model and further corroborates the hypothesis that drug dependence is more strongly related to mental disorders than abuse.

Table 6 shows the results of a regression model that examined the influence of mental disorders, monthly income, sex, prison environment, and race on alcohol dependence. Overall, the independent variables were significantly associated with the dependent variable (F = 106.174; P ≤ .000), although they explained only 6.5% of the variation in alcohol dependence within the sample. The low VIF and high tolerance confirmed that multicollinearity did not threaten the model's validity. The only statistically insignificant variable in the model was sex, while the remaining variables were significant at p ≤ .001. Abuse of alcohol and drugs by the respondents' parents or guardians shared the strongest relationship with drug dependence with a standardized

beta coefficient of .156. Diagnosis of a mental disorder shared the second strongest

relationship with a standardized beta coefficient of .125. Thus, a co-occurring alcohol

dependence disorder was more likely among inmates who suffered from a mental

disorder than among those who did not. Alcohol dependence was also more likely among

state prison inmates (B = .071), white inmates (B = .056), and inmates with lower

monthly income (B = -.064), though the substantive significance of these relationships

and the regression model as a whole are too low to form meaningful conclusions.

Table 6

Linear Regression Model 2

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig	Tol.	VIF
(Constant)	2.049	.144		14.213	.000		
Mental disorders measure	.378	.032	.125	11.768	.000	.914	1.094
Male	.058	.098	.006	.595	.552	.930	1.075
State prison inmate	.657	.094	.071	6.961	.000	.975	1.025
White	.402	.074	.056	5.448	.000	.973	1.028
Monthly income in month before arrest	-.070	.011	-.064	-6.219	.000	.966	1.035
Parents or guardians abused drugs or alcohol	1.148	.076	.156	15.092	.000	.967	1.034
Dependent variable: AlcDependence	R^2 = .066			Adjusted R^2 = .065			$p \leq .000$

Table 7 shows the results of a regression model that examined the influence of

mental disorders, income, prison environment, and race on drug dependence. Similar to

the alcohol dependence model, the independent variables shared a significant relationship

with the dependent variable (F = 161.893; P ≤ .000), though they explained only 7.5% of

the variation in drug dependence. All variables except monthly income in the year before

admission to prison shared significant relationships with drug dependence at p ≤ .001;

monthly income shared no statistically significant relationship with the dependent

variable. As with alcohol dependence, drug and alcohol abuse in respondents' parents or

guardians shared the strongest relationship with drug dependence (B = .138). Mental

disorder shared the next strongest relationship (B = .107), suggesting that drug

dependence was more frequently reported among inmates who suffered from a mental

disorder than among those who did not. Females were also more likely to report drug

dependent behavior (B = -.106), consistent with previous research in which female

prisoners were more likely than males to use drugs, use harder drugs such as heroin, and

more likely to have histories of sexual assault (Conklin, Lincoln, & Tuthill, 2000). State

prison inmates (B = .054) and white inmates (B = .106) were also more likely to report

drug dependent behavior in the year before admission to prison, though the relationship

between state prisoners and self-report of drug dependence is hampered by low

substantive significance.

Table 7

Linear Regression Model 3

Model	Unstandardized Coefficients		Std. Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig	Tol.	VIF
(Constant)	2.904	.135		21.468	.000		
Mental disorders measure	.361	.031	.107	11.597	.001	.918	1.090
Male	-1.052	.090	-.106	11.642	.002	.935	1.069
State prison inmate	.564	.092	.054	6.108	.003	.981	1.019
White	.845	.071	.106	11.838	.004	.968	1.033
Monthly income in month before arrest	.014	.011	.012	1.304	.192	.968	1.033
Parents or guardians abused drugs or alcohol	1.141	.074	.138	15.430	.000	.971	1.029
Dependent variable: DrugDepend	$R^2 = .075$			Adjusted $R^2 = .075$			$p \leq .000$

Two models were constructed to more completely test the influence of self-

medication among the sample. The constituent measures of the mental disorders variable,

diagnosis of specific mental disorders by a mental health professional, were entered into a

multiple regression model to determine which disorders were most strongly correlated to

alcohol and drug dependence. Measures of drug and alcohol abuse were not significantly related to mental disorder and were omitted from this stage of the analysis.

Table 8 shows the results of this analysis using alcohol dependence as the dependent variable. The model was a statistically significant predictor of alcohol dependence (F = 64.973; P ≤ .000), though its validity was weak as the independent variables explained only 6.6% of the variation in alcohol dependence. Nonetheless, a few interesting patterns appeared in this model. No statistically significant relationship was detected between alcohol dependence and the diagnosis of posttraumatic stress disorder, schizophrenia, or of respondent sex, while panic disorders, bipolar disorders, and income were significant at the P ≤ .05 level. Abuse of drugs and alcohol by parents and guardians was most strongly predictive of alcohol dependence in the model (B = .154). Depressive disorders shared the next strongest relationship with alcohol dependence (B = .092), suggesting that alcohol dependence was more likely among inmates with a diagnosis of depressive disorder than among those without, although the observed relationship was too weak to conclusively interpret. The remaining measures suffered similarly in the model, with standardized beta coefficients near or below .072. Overall, the only independent variable that reliably predicted self-reports of alcohol dependence was alcohol and drug abuse by parents.

Table 8

Linear Regression Model 4

Model	Unstandardized Coefficients		Std. Coefficients	t	Sig	Collinearity Statistics	
	B	Std. Error	Beta			Tol.	VIF
(Constant)	2.014	.145		13.927	.000		
Panic disorder	.389	.144	.031	2.698	.007	.773	1.294
Depressive disorder	.792	.111	.092	7.126	.000	.615	1.626
Bipolar disorder	.380	.137	.035	2.774	.006	.651	1.536
PTSD	-.012	.158	.000	-.075	.940	.803	1.245
Schizophrenia	.009	.189	.001	.048	.962	.862	1.160
Male	.084	.099	.009	.850	.395	.917	1.091
State prison inmate	.661	.094	.072	6.994	.000	.974	1.027
White	.381	.074	.053	5.157	.000	.966	1.036
Monthly income in month before arrest	-.069	.011	-.064	-6.202	.000	.964	1.037
Parents or guardians abused drugs or alcohol	1.139	.076	.154	14.973	.000	.966	1.036

Dependent variable: AlcDependence $R^2 = .067$ Adjusted $R^2 = .066$ $p \leq .000$

Similar results were found between these variables and drug dependence and are

listed in Table 9. This model was also a statistically significant predictor of drug

dependence (F = 101.396; P ≤ .000), and its validity was slightly stronger than that for

alcohol dependence, though the independent variables only explained 7.8% of the

variation in drug dependence. No significant relationships were found between drug

dependence and posttraumatic stress disorder, schizophrenia, or monthly income before

admission to prison, while all but panic disorders shared significant relationships at the p

≤.000 level. Panic disorders shared a significant relationship at p ≤ .05. The substantive

significance of these relationships was very weak, however. Parental and custodial abuse

of drugs and alcohol once again shared the strongest relationship with the dependent

variable (B = .137) and suggested that self-reports of drug dependence were more likely

among respondents whose parents were substance abusers. Bipolar disorders shared the

strongest relationship with drug dependence (B = .071) and suggested that drug

dependence was more likely among inmates diagnosed with bipolar disorder, though the

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relationship was too weak to allow for a conclusive statement. Drug dependence was also

more likely among females (B = -.102), white inmates (B = .102), and state prison

inmates (B = .054). The remainder of the mental disorder measures shared weaker

relationships than bipolar disorder, and all were weaker than the relationships between

the control variables.

Table 9

Linear Regression Model 5

Model	Unstandardized Coefficients		Std. Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig	Tol.	VIF
(Constant)	2.880	.135		21.259	.000		
Panic disorder	.329	.140	.024	2.346	.019	.769	1.301
Depressive disorder	.582	.108	.060	5.373	.000	.616	1.623
Bipolar disorder	.876	.133	.071	6.576	.000	.654	1.529
PTSD	-.144	.153	-.009	-.938	.349	.805	1.242
Schizophrenia	-.205	.181	-.011	-1.132	.258	.852	1.174
Male	-1.010	.091	-.102	-11.112	.000	.922	1.085
State prison inmate	.561	.092	.054	6.081	.000	.980	1.021
White	.817	.072	.102	11.423	.000	.961	1.041
Monthly income in month before arrest	.012	.011	.010	1.151	.250	.967	1.035
Parents or guardians abused drugs or alcohol	1.131	.074	.137	15.313	.000	.970	1.031
Dependent variable: DrugDepend	$R^2 = .078$		Adjusted $R^2 = .078$				$p \leq .000$

<u>Summary</u>

Overall, multiple regression analysis found mixed results for a relationship

between mental disorders and maladaptive substance use, particularly when respondents

reported dependence upon alcohol and drugs. No statistically significant relationship

between the substance abuse measures and mental disorder was detected. The models

were constructed from two different questions: "what influences mental disorder among

prison inmates," and "what influences maladaptive substance use among inmates?"

While the models using mental disorders as the dependent variable provided weak

support for co-occurring disorder and self-medication among the sample, the substance dependence models were too weak to interpret. Models using alcohol and other drug dependence as dependent variables were constructed, though their predictive value was severely compromised by both the models' and the variables' low substantive significance. Regressing the alcohol and drug abuse measures upon specific mental disorder diagnoses found weak support for a connection between depressive disorders and alcohol dependence, but the independent variables explained too little of substance dependence to allow for a conclusive prediction. Within all models, the strongest and most consistent predictor of drug and alcohol dependence was substance abuse by the respondents' parents or guardians. The next chapter is dedicated to discussing the implications of these findings.

CHAPTER 5

DISCUSSION

The current study was conducted to determine if a relationship existed between diagnosis of mental disorders and maladaptive substance use within a nationally representative sample of state and federal prison inmates. Eight hypotheses were formulated and tested:

H1: Substance abuse is positively related to mental disorder.

H2: Substance dependence is positively related to mental disorder.

H3: Alcohol abuse is positively related to mental disorder.

H4: Alcohol dependence is positively related to mental disorder.

H5: Alcohol abuse will share a stronger relationship with mental disorder than will substance abuse.

H6: Alcohol dependence will share a stronger relationship with mental disorder than will substance dependence.

H7: Alcohol dependence will share a stronger relationship with mental disorder than will alcohol abuse.

H8: Drug dependence will share a stronger relationship with mental disorder than will drug abuse.

The multiple regression models found weak, mixed, or no support for these hypotheses. Furthermore, the results were too weak to offer definite support for self-

medication in the sample. These results, their implications, and the study's limitations are discussed below.

<div align="center">Findings</div>

Maladaptive Alcohol Use and Mental Disorders

Five hypotheses specifically stated relationships between alcohol use and mental disorders. None of the regression models supported a relationship between alcohol abuse and mental disorder (Hypotheses 3 and 5). This finding is interesting because other studies suggest people diagnosed with mental disorders are more susceptible to the effects of drugs (Mueser, Drake, & Wallach, 1998), and thus even low doses of drugs would be expected to encourage some of the behaviors consistent with drug abuse identified in the DSM-IV TR. Furthermore, alternative explanations to the self-medication hypothesis suggest that substance use actually worsens an individual's mood or affect (Arendt et al., 2007; Schuckit & Monteiro, 2006; Williams, 1966), and the absence of a significant relationship between alcohol abuse and mental disorders is particularly puzzling in light of this research. At present no satisfactory explanation for the lack of a relationship between these two constructs is available, and this provides an excellent question for further studies to examine.

Alcohol dependence shared a positive relationship with diagnosis of mental disorder (Hypothesis 4) and was indeed stronger than the association with alcohol abuse (Hypothesis 7) in that an association between alcohol dependence and mental disorder existed, where one between alcohol abuse and mental disorder did not. Lifetime diagnosis of mental disorders were more likely to be reported among respondents who reported dependence upon alcohol in the year before admission to prison, and alcohol dependence

was more likely among respondents who reported diagnosis of a mental disorder. Furthermore, diagnosis of panic disorders, depressive disorders, and bipolar disorders were more likely among respondents who reported alcohol dependence than among those who did not.

Two cautions significantly inhibit conclusions based upon these models. First, the substantive significance of these models and the relationships observed within was very low. The independent variables entered into the mental disorders model explained only 10.3% of the variation in mental disorders, while the variables for the alcohol dependence model explained only 6.5% of alcohol dependence when mental disorders were aggregated and 6.6% of alcohol dependence when disorders were disaggregated. Additionally, the beta coefficients for these relationships were low. The aggregated mental disorders measure shared a weak relationship with alcohol dependence as a dependent variable (p = .000; B = .125) and a nearly uninterpretable relationship when mental disorders were the dependent variable (p = .000; B = .084). This was especially true when mental disorders were disaggregated and regressed upon alcohol dependence; depressive disorders shared the strongest relationship of all the mental disorders (p = .000; B = .092), but the relationship was too weak to warrant a strong conclusion regarding its effect upon alcohol dependence. The remaining mental disorder measures were even weaker, with some beta coefficients below .050. Altogether, this means the selected variables do not explain near enough of the variables to warrant a strong conclusion upon these models.

Second, both alcohol dependence and diagnosis of mental disorder were explained by the influence of other variables. The strongest predictor of mental disorder

diagnosis was sex, with self-reports of mental disorder diagnosis more likely among female inmates (p = .000; B = -.198). Alcohol dependence shared the strongest relationship with parental or guardian abuse of alcohol and drugs, with inmates more likely to report alcohol dependence if their parents were drug or alcohol abusers (p = .000; b = .156), This is consistent with the Diagnostic and Statistical Manual's description of substance dependence, which states that between 40% to 60% of the variation in dependence can be explained by family history. The weaker relationship between mental disorder and substance dependence in comparison to parental abuse of substances suggests that other factors not captured in the model, and not measured by the survey, explain both substance dependence and mental disorder. The construction of this measure does not distinguish genetics from environment, or abuse from dependence. Thus, the parental substance abuse measure itself does not clearly measure the mechanism by which alcohol dependence is effected.

Finally, the regression models offered limited support for a stronger association between alcohol dependence and mental disorder than for drug dependence and mental disorder. When mental disorder was treated as the dependent variable, alcohol dependence exhibited a standardized coefficient of .084, compared to .074 for drug dependence. While both coefficients indicated a greater likelihood of diagnosis of a mental disorder among inmates who reported alcohol and drug dependence than among those who did not, the stronger coefficient for alcohol dependence suggests the association is stronger among those who report alcohol dependence (Hypothesis 6). When drug and alcohol dependence were treated as dependent variables, mental disorder shared a stronger relationship with alcohol dependence (p = .000; B = .125) than with

drug dependence (p = .000; B = .107), though the drug dependence model explained more of the dependent variable than did the alcohol dependence model. Thus, the relative strength of alcohol and drug dependence's relationship with mental disorder is difficult to determine and comparative statements regarding which is the better predictor of the other are difficult to make. Similar results were found when mental disorders were disaggregated; stronger relationships were discovered between alcohol dependence and mental disorder than with drug dependence, though the drug dependence model explained more of the variation in the dependent variable. The distinction is rendered moot due to extremely low R-Squared and beta coefficients, however.

Drug Use and Mental Disorders

Linear regression analysis revealed patterns in drug abuse and dependence similar to alcohol abuse and dependence. As with alcohol abuse and mental disorder, drug abuse and mental disorder were not significantly related in any model (Hypotheses 1 and 5), though the models offered mixed support for an association between drug dependence and mental disorder (Hypotheses 2 and 8). When mental disorders were treated as the dependent variable, drug dependence shared a positive though very weak (p = .000; B = .074) relationship with mental disorders. While the relationship was too weak to conclusively interpret, a stronger relationship would suggest that diagnosis of a mental disorder was more likely among inmates who reported dependence upon drugs than among those who did not. The predictive value of drug dependence was severely diminished by the influence of sex (p = .000; B = -.198) and parental abuse of substances (p = .000; B = .093).

Drug dependence as the dependent variable shared a positive, though weak (p = .001; B = .107) relationship with mental disorders, which suggested that drug dependence was more likely among inmates diagnosed with a mental disorder than among those not so diagnosed. Significant relationships were also found between drug dependence, panic disorders (p = .019; B = .029), depressive disorders (p = .000; b = .060), and bipolar disorders (p = .000; B = .071), though the weak substantive significance of these relationships prohibited any meaningful conclusions. Furthermore, abuse of drugs and alcohol by parents or guardians more effectively explained drug dependence than did mental disorders whether mental disorders were entered as a single variable or disaggregated.

<div align="center">Implications and Further Research</div>

Any conclusions drawn from the analyses must be done so cautiously with the caveat that the results were hampered by significantly weak models and low substantive significance between variables in each model. With these caveats in mind, the results suggested that comorbidity of mental disorders and maladaptive substance use continue to be a problem among prison inmates, and self-medication may be at least partially responsible for substance dependence among inmates with mental disorders, though the weakness of the relationships prevents any conclusive statements regarding self-medication as a mechanism for substance addiction

First, each model suggested mental disorders were more strongly related to alcohol dependence than to drug dependence. One possible reason is relatively easier access to alcohol than for other drugs. The illegal purchase and use of drugs, either illegal drugs or illegally obtained prescription drugs, is a criminal act, whereas alcohol is readily

obtainable from most retailers. More opportunity exists to acquire alcohol and to form

dependence upon it. The reverse side of this relationship also suggests that a person

diagnosed with a mental disorder is also more susceptible to the negative effects of

alcohol and can form dependence upon it more easily due to relatively uninhibited access.

These distinctions may be moot due to the influence of alcohol and substance abuse by

parents and guardians, which shared the strongest relationship of any variable. Substance

abuse by parents imparts both a genetic (Gelernter & Kranzler, 2008) and environmental

(American Psychiatric Association, 2000) influence upon development of alcohol

dependence in that genetic predisposition to chemical dependence is embedded in the

individual, which can be triggered through easy access to alcohol or drugs provided by

family. While past research definitely favors family history over mental disorder as an

explanation for alcohol dependence, future research should determine if genetics or

environment play the stronger role in encouraging alcohol dependence. The next iteration

of this survey in particular should also expand the section dedicated to measures of

family history with drugs and alcohol to allow further distinction between the influence

of genetics and environment on disposition to alcohol dependence.

First, despite evidence that diagnosis of a mental disorder and substance

dependence were related in the sample, abuse of drugs and alcohol by the respondent's

parents were clearly the stronger factor in determining either mental disorders or

substance dependence. Additionally, the regression models found limited support for the

association of substance dependence with certain types of mental disorders and none for

others. This can be attributable either to genetics, environment or the confluence of the

two. Respondents could have inherited biochemical or genetic predisposition to substance

dependence that had been passed down for many generations within their families and later enabled through access to alcohol and drugs (Gelernter & Kranzler, 2008). Alternatively, respondents could have learned attitudes and beliefs regarding the acceptability of substance use and its effects from parents or guardians; this is one possible interpretation of earlier onset of drug use by children of alcohol-dependent parents (Obot, Wagner, & Anthony, 2001). Both genetics and learned behavior are in the DSM-IV text revision (American Psychiatric Association, 2000), though the questionnaire for this study did not include measures of familial drug use beyond the respondents' parents or guardians. Thus, the true influence of respondents' families upon their substance use habits is indeterminable from the current dataset. The relationship between family history of substance use and inmates' current use patterns is an interesting topic for future investigation. Additionally, similar attempts should be made to determine generational patterns of mental disorder in inmates' families. If substance dependence develops in an individual diagnosed with a mental disorder with no family background of either mental disorder or substance dependence, the dynamics by which the individual was introduced to drugs and later became addicted would provide valuable insight into the prevention of substance addiction in vulnerable populations.

Interestingly, significant relationships were discovered between mental disorders and substance dependence but not with substance abuse. Because the measures for dependence and abuse were coded as strictly mutually exclusive, this is most likely attributable to study design, but the utter lack of a relationship between these two constructs is puzzling and not readily explicable. One possibility is that substance dependence is a less ambiguous measure of maladaptive substance use than substance

abuse. Respondents suffering from substance dependence may be less able to deny their condition than individuals who abuse drugs without symptoms of tolerance or withdrawal because the constant need for drugs or alcohol serve as a reminder of the individual's disorder. The more transient symptoms of alcohol and drug abuse, such as involvement in dangerous situations or arguments with a person's significant other, may be quickly forgotten over time or not remembered at all due to intoxication. Future research could further investigate the nature of these two different consequences of substance use and their relationship with mental disorders.

<div align="center">Limitations</div>

While direct conclusions from this study are undermined by conceptual and measurement issues in the dataset, the limitations of this paper offer potential for improvement to the survey that became apparent during data analysis and possible questions for future investigators to consider.

First, statements regarding co-occurring disorder among the sample were limited due to the differences between the mental health measures and the substance use measures. Specifically, participants were asked if they had been diagnosed with selected mental disorders *within their lifetime*, a measure of prevalence, while at the same time asked if *in the year before admission to prison for their most recent offense* they had exhibited the specific symptoms of substance abuse or dependence previously described in this study, a measure of incidence. The mental disorder diagnosis could have occurred anytime within the respondent's lifetime, within the institution or while in the general population, and the degree to which the mental disorder diagnosis ran concurrent with a substance abuse disorder was indeterminable from the data provided. While a limited

number of direct measures for certain symptoms of specific disorders were available, such as auditory or visual hallucinations, the unreliable nature of self-report measures combined with the small number of these measures made them even more inappropriate for constructing a comprehensive profile of inmates' mental health.

Overall, the models were constructed to serve as predictors of co-occurring disorder have very little to say about it beyond the observation that diagnosis of mental disorder in the lifetime of sample participants was associated with substance dependence. Arguably, these issues are an inseparable element of cross-sectional and self-report data because follow-up information is not available when running analyses from secondary data and the veracity of offenders' claims is difficult to accurately determine. Nonetheless, the validity of studies based upon future iterations of the survey depends upon the addition of more comprehensive measures of mental disorder diagnosis. Future iterations of this survey in particular could ask when the most recent diagnosis of a mental disorder by a mental health professional was made, or if such a diagnosis was made within a specified number of years before admission to prison; how severe the disorder was; how long the symptoms have persisted; and whether the symptoms have been in remission since the most recent diagnosis. Future surveys should also ask whether a member of the person's family going back as many generations as the inmate can remember had been diagnosed with any of the mental disorders specified in the survey.

Another limitation is the nature of the mental disorder and substance dependence measures. Similar to the caution previously described, it is not possible to know from secondary data whether one or more illnesses were in remission at the time of arrest or admission to prison, or the extent to which alcohol dependence and mental disorder

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influence each other. The regression models suggested that mental disorder exerts more influence upon drug and alcohol dependence than dependence does upon mental disorder, though the design of the measures does not distinguish whether mental disorders began inside or outside of prison.

Finally, the most significant problem with the models was low substantive significance that threatened the validity of the models overall and low standardized coefficients within the models themselves. Diagnosis of mental disorders and both dependence measures exhibited standardized coefficients below .090 when mental disorders were treated as the dependent variable. These coefficients were greater than .100 when drug and alcohol were treated as dependent variables, but the adjusted R-Squared values for the models did not exceed .075, meaning that the selected variables explained a very small percentage of the variation in substance dependence. This can be improved by strengthening the mental disorders and substance dependence measures as suggested above so future studies can determine with greater precision the influence family history exerts upon both mental disorder and substance dependence. The strong relationship between abuse of alcohol and drugs by parents in each model suggests much more of the variation in substance dependence can be explained through fine-tuning of these measures.

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APPENDIX

Survey Questions Used in Analysis

DEMOGRAPHIC QUESTIONS

Section 1, Question 1a
Sex (by observation – ask only if not apparent
    (1) Male
    (2) Female

Section 1, Question 3c
Which of these categories describes your race?
MARK ALL THAT APPLY
    (1) White
    (2) Black or African American
    (3) American Indian or Alaska Native
    (4) Asian
    (5) Native Hawaiian or Pacific Islander
    (6) All other races – *Specify* _____
    (D) Don't know

            Recoded:
                (1) White
                (0) Non-white

Section 7, Question 11c
Which category on this card represents your personal monthly income from ALL sources
for the month before your arrest, that is, from [MONTH] 1st to [MONTH] [28-31],
[YEAR]?
    (00) No income *Skip to Section 7, Question 12a*
    (01) $1 - 199
    (02) $200 - 399
    (03) $400 - 599
    (04) $600 – 799
    (05) $800 – 999
    (06) $1,000 – 1,199
    (07) $1,200 – 1,499
    (08) $1,500 – 1,999
    (09) $2,000 – 2,499
    (10) $2,500 – 4,999
    (11) $5,000 – 7,499
    (12) $7,500 or more
    (97) Don't know
    (98) Refused
    (99) Blank

Section 7, Question 13a

When you were growing up, did any of your parents or guardians abuse alcohol or drugs?

    (1) Yes
    (2) No

       Recoded:
          (0) No
          (1) Yes

ALCOHOL ABUSE QUESTIONS

Section 8, Question 6b.

In your entire life, have your EVER driven a car, motorcycle, truck, boat, or any other vehicle after having too much to drink?

    (0) Yes
    (1) No
    Blind D or R – Skip to question 8d

       Recoded:
          (0) No
          (1) Yes

Section 8, Question 6c

In your entire life have your EVER had an ACCIDENT after you were driving?

    (1) Yes
    (2) No
    (R) Refused

       Recoded:
          (0) No
          (1) Yes

Section 8, Question 6e1

During the year before your admission to prison, did you –

    (1) Yes   (2) No

    ___ Get into situation while drinking or after drinking that increased your chances of getting hurt – like driving a car or other vehicle, swimming, using machinery, or walking in a dangerous area or around heavy traffic? [@1]

___ Have arguments with your spouse, boyfriend/girlfriend, family, or friends while drinking or right after drinking? [@2]

___ Lose a job because of your drinking? [@3]

Recoded:
    (0) No
    (1) Yes

Section 8, Question 6e2
During the year before your admission to prison, did you –

(1) Yes   (2) No

___ Have job or school trouble because of your drinking – like missing too much work, not doing your work well, being demoted at work, or dropping out of school? [@4]

___ Get arrested or held at a police station because of your drinking? [@5]

___ Get into a physical fight while drinking or right after drinking? [@6]

Recoded:
(0) No
(1) Yes

Section 8, question 6 f1
During the year before your admission to prison –

(1) Yes   (2) No

___ Did your drinking or being sick from drinking keep you from doing work, going to school or caring or children? [@4]

Recoded:
(0) No
(1) Yes

ALCOHOL DEPENDENCE QUESTIONS

Section 8, question 6 f1
During the year before your admission to prison –

(1) Yes   (2) No

___ Did you often drink more or for longer periods of time than you meant to? [@1]

___ Did you more than once want to cut down on your drinking or try to cut down on your drinking or try to cut down on your drinking but found you couldn't do it? [@2]

___ Did you spend a lot of time drinking or getting over the bad aftereffects of drinking? [@3]

___ Did you give up activities that you were interested in or were important to you in favor of drinking – like work, school, hobbies, or associating with family and friends? [@5]

Recoded:
   (0) No
   (1) Yes

Section 8, question 8, f2
During the year before your admission to prison –

(1) Yes   (2) No

___ Did you continue to drink even though it was causing emotional or psychological problems? [@6]

___ Did you continue to drink even though it was causing problems with family, friends or work? [@7]

___ Did you continue to drink even though it was causing physical health or medical problems? [@8]

___ Did your usual number of drinks have less effect on you that it once did or did you have to drink more to get the effect you wanted? [@9]

___ Did you find that you experienced some of the bad aftereffects of drinking after cutting down on your drinking or stopping drinking – like shaking, feeling nervous or anxious, sick to your stomach, restless, sweating, or having trouble sleeping or fits or seizures, or see, feel, or hear things that weren't really there? [@10]

___ Did you often take a drink or use any other drug to get over any of the bad aftereffects of drinking or to keep from having them? [@11]

Recoded
(0) No

(1) Yes

DRUG ABUSE QUESTIONS

Section 8, question 11e
In your entire life, have you EVER driven a car, motorcycle, truck, boat, or any other vehicle while under the influence of drugs?

(1) Yes
(2) No
Blind D or R – skip to section 8, question 11 g1

Recoded:
(0) No
(1) Yes

Section 8, question 11f

In your entire life, have you EVER had an accident while under the influence of drugs?

(1) Yes
(2) No
(R) Refused

Recoded:
(0) No
(1) Yes

Section 8, question 11 g1

During the year before your admission to prison, did you –

(1) Yes   (2) No

___ Get into situations while using drugs or just after using drugs that increased your chances of getting hurt – like driving a car or other vehicle, swimming, using machinery, or walking in a dangerous area or around heavy traffic? [@1]

___ Have arguments with your spouse, boyfriend/girlfriend, family, or friends while under the influence of drugs? [@2]

___ Lose a job because of your drug use? [@3]

Recoded:
(0) No
(1) Yes

Section 8, Question g2
During the year before your admission to prison, did you –

(1) Yes   (2) No

___ Have job or school trouble because of your drug use – like missing too much work, not doing your work well, being demoted at work, or dropping out of school? [@4]

___ Get arrested or held at a police station because of your drug use? [@5]

___ Get into a physical fight under the influence of drugs? [@6]

Recoded:
(0) No
(1) Yes

Section 8, Question 12 a1

(1) Yes   (2) No

___ Did using drugs or being sick from using drugs keep you from doing work, going to school or caring or children? [@4]

Recoded:
(0) No
(1) Yes

DRUG DEPENDANCE QUESTIONS

Section 8, Question 12 a1

(1) Yes   (2) No

___ Did you often use a drug in larger amounts or for longer periods of time than you meant to? [@1]

___ Did you more than once want to cut down on your drug use but found you couldn't do it? [@2]

___ Did you spend a lot of time getting drugs, using them, or getting over their bad aftereffects? [@3]

___ Did you give up activities that you were interested in or were important to you in favor of using drugs – like work, school, hobbies, or associating with family and friends? [@5]

Recoded:
(0) No
(1) Yes

Section 8, Question 12, a2
During the year before your admission to prison –

(1) Yes   (2) No

___ Did you continue to use drugs even though it was causing emotional or psychological problems? [@6]

___ Did you continue to use drugs even though it was causing problems with family, friends or work? [@7]

___ Did you continue to use drugs even though it was causing physical health or medical problems? [@8]

___ Did your usual amount of drugs have less effect on you that it once did or did you have to use more to get the effect you wanted? [@9]

___ Did you find that you experienced some of the bad aftereffects of drinking after cutting down on your drinking or stopping drinking – like shaking, feeling nervous or anxious, sick to your stomach, restless, sweating, or having trouble sleeping or fits or seizures, or see, feel, or hear things that weren't really there? [@10]

___ Did you ever keep using drugs to get over any of the bad aftereffects of drinking or to keep from having them? [@11]

Recoded:
(0) No
(1) Yes

MENTAL HEALTH QUESTIONS

Section 9, Question 9a
Have you ever been told by a mental health professional, such as a psychiatrist or psychologist, that you had

(1) Yes   (2) No

___ A depressive disorder [@1]

___ Manic-depression, bipolar disorder, or mania [@2]

___ Schizophrenia, or another psychotic disorder [@3]

___ Post-traumatic stress disorder [@4]

___ Another anxiety disorder, such as a panic disorder [@5]

___A personality disorder (such as an antisocial or borderline personality disorder) [@6]

___ Any other mental disorder *Specify*_____ [@sp]

    Recoded:
(0) No
(1) Yes

VITA

JOHN RICHARD HAGGERTY

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Date of Birth: March 24, 1985

Place of Birth: Baltimore, MD

Education:

Bristol Tennessee High School, Bristol, Tennessee

East Tennessee State University, Johnson City, TN

B.S. Criminal Justice & Criminology, December 2006

M.A. Criminal Justice & Criminology, August 2011

Professional Experience:

Graduate Assistant, Department of Criminal Justice & Criminology, 2009-2011

Class Instructor

Introduction to Criminal Justice, 2010-2011

Publications:

Simon, L. M. J., Ellwanger, S. & Haggerty, J. (2010). Reversing the historical tide of iatrogenic harm: A therapeutic jurisprudence analysis of increases in arrests of domestic batterers and rapists. *International Journal of Law and Psychiatry*, *33*. 306-320.

Honors and Awards

Dean's List. East Tennessee State University – Spring 2004 – Fall 2006.

Summa Cum Laude. East Tennessee State University, December 2006.

Faculty Award: Outstanding Undergraduate Student in Criminal Justice & Criminology, 2007

Graduate Assistant Distinguished Service Award, 2011