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Predicting Successful Drug Court Graduation: Exploring Demographic and Psychosocial Factors among Medication-Assisted Drug Court Treatment Clients

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Predicting Successful Drug Court Graduation:
Exploring Demographic and Psychosocial Factors among Medication-Assisted
Drug Court Treatment Clients

by

Autumn M. Frei

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
Department of Criminology
College of Behavioral and Community Sciences
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Dedication

This dissertation is dedicated to the memories of my aunt, Marykarita Richardson, and my grandmother, Katherine Richardson, with thanks for their unconditional love, constant support, and endless encouragement. Their emphasis on learning, using both traditional and not so traditional means, and on pursuing your dreams even in the face of hardship is what helped to get me through. They are greatly missed, but forever remembered. Thanks for always reading me one more story.

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Table of Contents

List of Tables	iii
List of Figures	v
Abstract.....	vi
Chapter 1: Introduction	1
Chapter 2: The Criminal Justice and Public Health Burdens of Substance Abuse	8
Chapter 3: Substance Abuse and the Criminal Justice System:	15
A Behavioral Health Perspective	15
Therapeutic Jurisprudence: Drug Courts	17
Mental Health Symptoms, Substance Abuse, and Drug Courts	24
Trauma, Substance Abuse, and Drug Courts	30
Social Support, Substance Abuse, and Drug Courts.....	33
Chapter 4: Research Design and Methods.....	37
Procedures	38
Sample	39
Research Questions	41
Measures of Variables	42
Analytic Plan	44
Research Question 1	45
Research Question 2	46
Research Question 3	46
Research Question 4	46
Chapter 5: Results	47
Bivariate Analyses	47
Multivariate Analyses	51
Research Question 1	51
Research Question 2	52
Research Question 3	55
Research Question 4	56
Summary of Results	60
Chapter 6: Discussion.....	61
Demographic Variables – Findings and Implications	62
Independent Variables – Findings and Implications.....	68

Limitations	73
Conclusion and Recommendations for Future Research.....	74
References	76
Appendix A: Extant Literature on Drug Court Outcomes	98

List of Tables

Table 1.	Excerpts from the National Survey on Drug Use and Health 2011	10
Table 2.	Economic Impact of Illicit Drug Use on American Society	12
Table 3.	Ten Key Components of Drug Court.....	20
Table 4.	Comparison of Total Population, Excluded, and Final Sample Demographics.....	41
Table 5.	Descriptive Statistics for Selected Sample by Drug Court Graduation.....	48
Table 6.	Bivariate Correlations Study Variables	50
Table 7.	Logistic regression analysis testing the effect of demographic variables on drug court graduation	51
Table 8.	Logistic regression analysis testing the effect of traumatic stress on drug court graduation controlling for demographics (using TSS as measure of trauma).....	52
Table 9.	Logistic regression analysis testing the effect of traumatic stress on drug court graduation controlling for demographics (using TSS Revised as measure of trauma)	55
Table 10.	Logistic regression analysis testing the effect of traumatic stress on drug court graduation controlling for demographics (using PCL as measure of trauma).....	55
Table 11.	Logistic regression analysis testing the effect of mental health symptom severity on drug court graduation controlling for demographics.....	56
Table 12.	Logistic regression analysis testing the effect of access to prosocial support on drug court graduation controlling for demographics.....	57
Table 13.	Logistic regression analysis testing the effect of the emotional support subscale of the Social Support Survey Instrument on drug court graduation controlling for demographics	58
Table 14.	Logistic regression analysis testing the effect of the tangible support subscale of the Social Support Survey Instrument on drug court graduation controlling for demographics	59

Table 15.	Logistic regression analysis testing the effect of the affectionate support subscale of the Social Support Survey Instrument on drug court graduation controlling for demographics.....	59
Table 16.	Logistic regression analysis testing the effect of the positive social interaction subscale of the Social Support Survey Instrument on drug court graduation controlling for demographics	59

List of Figures

Figure 1. Comparison of Distribution of Trauma Scores	54
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Abstract

The purpose of this study was to examine the influence of psychosocial factors on drug court graduation among a medication assisted treatment drug court population. The extant research identifies drug courts as effective in reducing recidivism and relapse rates; however meta-analyses of the drug court literature reveal that there is little explanation as to why drug courts are effectual and especially for whom. This study examined trauma, mental health, and social support to determine predictive psychosocial factors of drug court participants while controlling for certain demographics. The analyses showed that social support was predictive, but failed to identify trauma or mental health correlates. Policy implications are discussed.

Chapter 1: Introduction

Individuals who become involved with the criminal justice system frequently engage in substance abusing behaviors. The relationship between substance use and crime has been well established (Andrews & Bonta 2010). Drug arrests account for the highest number of arrests in the United States, with the criminal justice burden for processing these individuals increasing year after year despite punitive policies aimed at reducing recidivism (Belenko, Fagin, & Chin, 1991). Empirical evidence also establishes a relationship between mental illness and substance abuse (Frisher, Crome, Macleod, Millson, & Croft, 2005; Steadman, Osher, Robbins, Case, & Samuels, 2009). Additionally, drug offenders often report exposure to traumatic stress experiences over the course of their lifetime. These experiences can lead to trauma-related disorders or other mental health symptoms (Subica, Claypoole, & Wylie, 2012; Wu, Schairer, Dellor, & Grella, 2010). Individuals with mental illness and co-occurring mental health and substance abuse disorders are disproportionately arrested and incarcerated at rates higher than their counterparts in the justice system without mental health issues (Abram, Teplin, & McClelland, 2003; Fazel & Danesh, 2002; Steadman, et al., 2009). A study by the Bureau of Justice Statistics using national data found that 76% of jail inmates met criteria for mental illness and substance dependence or abuse (James & Glaze, 2006). More recently, these groups are becoming increasingly identified with the criminal justice system, and programs targeting these populations for diversion from incarceration to supervised treatment are developing throughout the United States. Dedicated interventions for justice-involved persons with co-occurring disorders or mental illness have demonstrated effectiveness. Examples of these interventions are: pre- and post-booking diversion programs, alternatives to sentencing programs such as pre-trial interventions, specialized probation,

evidenced-based practices such as forensic intensive case management and assertive community treatment, and specialty courts including drug courts and mental health courts.

The majority of criminological research on the drug-crime relationship has focused on patterns of criminal activity among drug offenders, pathways to substance abuse, influence of delinquent peers, racial contexts, desistance strategies, or the increase in incarceration rates in relation to legislative efforts of the war on drugs (Baumer, 1994; Durlauf & Nagin, 2011; Krohn, Lizotte, Thornberry, Smith, & McDowall; 1996; Mosher, 2001; Schroeder, Giordano, & Cernkovich, 2007; Spohn & Holleran, 2002). Although these areas are worthwhile to study, criminological research has overlooked several issues related to behavioral health. First, criminological studies of the drug-crime relationship often neglect the issues surrounding effective treatment services or criminal justice alternatives for substance abusing offenders and overlook possible interaction effects of psychosocial factors among substance abuse populations. Empirical research on substance abuse and crime from a behavioral healthcare perspective has identified mental illness and trauma as correlates of substance abuse and criminal justice involvement (Carlson, Schafer, & Dufee, 2010; Green, Daroowalla, & Siddique, 2005; Johnson, Ross, Taylor, Williams, Carvajal, & Peters, 2006; Messina, Grella, Burdon, & Prendergast, 2008). Justice-involved persons report higher rates of trauma than the general population (Beck, 2000; Hubbard & Matthews, 2008; Miller & Najavits, 2012; Sarchiapone, Carlia, Cuomoa, Marchettia & Roy, 2008; CANY-Women in Prison Project, 2006). High rates of trauma exposure among substance abusing adults have been reported as well (Acierno, 2003; Najavits, 2006; McCauley, et.al, 2009).

Along with its neglect of mental health and trauma effects on the drug-crime relationship, criminal justice research has also overlooked shifting trends from, for instance, the crack cocaine epidemic of the 1980s and 1990s to the current prescription drug epidemic (as defined by the Centers for Disease Control) that extend beyond traditional drug-crime associations. Nonmedical prescription drug use is quickly surpassing other substances as the most used substance among drug users, second

only to marijuana use among individuals aged 12 and older in the United States (NSDUH, SAMHSA, 2011). Currently, persons aged 18-25 report the highest use of nonmedical prescription drugs and are considered the most medicated generation in history (Apahall & Schwartz-Bloom, 2008; Quintero, 2005). Nevertheless, problems associated with the nonmedical use of prescription medication are having far-reaching effects across demographic groups. Unfortunately, national data on arrest rates for nonmedical prescription drug use are not available due to the manner in which drug arrests are recorded. However, data from the National Drug Intelligence Center, which surveys law enforcement agencies, indicate increases in gang activity related to the distribution of prescription medication, increased arrests for possession of narcotics and other psychopharmaceutical drugs without a prescription, increased illegal activities in the form of prescription fraud and doctor shopping schemes, and associations between pharmaceutical diversion (criminal acts involving prescription drugs) and property and violent crime (NDIC, NDTs, 2011). The consequences associated with the nonmedical use of prescription drugs mirror those of other illicit drug use: risks of substance abuse and dependence disorders, serious drug-related physical and mental health issues, increased risk factors for involvement in criminal activity with subsequent arrests and incarceration, and decreased quality of life issues (family disruption, loss of economic and educational opportunities and achievements) (McCabe, Cranford, Morales, & Young, 2006).

A final issue often downplayed in traditional criminological research is the growing shift to therapeutic jurisprudence over traditionally adversarial criminal justice responses that have had little impact on fighting the war on drugs. Alternatives to incarceration (ATI) programs provide a method to merge treatment with supervision. ATI provides the supervision warranted by the criminal behaviors of substance abusing offenders while also providing treatment to improve the issues that led to the crimes committed in order to support addiction or that resulted from problems related to addiction. Drug court programs are an example of ATI that have demonstrated positive outcomes. The drug court

model is an alternative method of criminal supervision that reduces the burden of drug crime on the criminal justice system by utilizing mandated treatment in conjunction with close court supervision (Hoffman, 1999; NADCIP, 2011, NIJ, 2006) to address drug addiction as the basis for criminal behavior. Research findings support drug court effectiveness in terms of decreased rates of recidivism and substance abuse relapses (Belenko, 2001; GAO, 2011; Gottfredson & Exum, 2002; Spohn, Piper, Martin & Frenzel, 2001). Additionally, research has demonstrated the benefits of the drug court model in terms of cost savings for both judicial processing and law enforcement activities (Huddleston, Marlowe, & Casebolt, 2008). However, some researchers have argued that effective outcomes of the drug court model are not clearly understood and that what works and how it works, and for whom, need further attention (Belenko, 2001; Cisner & Rempel, 2005; Hoffman, 1999; Marlowe, Festinger, Lee, Dugosh, & Benasutti, 2006).

One of the primary issues in drug court evaluation research involves variability in successful completion of drug court programs. In order to better discern why drug courts work, an understanding of factors associated with successful drug court graduation is necessary in order to make informed decisions in the assessment, management, and treatment of justice-involved individuals with substance abuse problems. A shortcoming of the extant literature on drug courts is the scarcity of research examining psychosocial characteristics of drug court clients or a focus on treatment outcomes in relation to these factors (Bouffard & Richardson, 2007; Hagedorn & Willenbring, 2003). Furthermore, examination of drug court offenders who abuse prescription medication and the study of medication-assisted treatment programs within the drug court context are fundamental in addressing the serious public health and criminal justice burden of the nonmedical use of pharmaceutical drugs.

A shift in the examination of the drug-crime relationship within criminology is needed to better explore an interdisciplinary approach to addressing current issues surrounding substance abuse offenders. To date, criminological research has not consistently or comprehensively evaluated

psychosocial factors related to the drug-crime relationship within an interdisciplinary framework, nor has there been an emphasis on investigating populations of nonmedical prescription drug users. Finally, although criminologists have examined drug courts and questioned their structure and processes, there is a lack of research on for whom drug courts work. A consideration within criminological research of the drug-crime relationship as a significant behavioral health care problem with substantial criminal justice and public health burdens is important, and further examination of drug court effectiveness in terms of the populations it serves contributes to literature on individual level factors that influence program completion.

An examination of psychosocial factors in relation to their contribution to negative or positive substance abuse treatment outcomes could be beneficial in terms of identifying risk conditions as well as protective factors for successful substance abuse treatment in criminal justice populations. Psychosocial factors such as untreated mental health or trauma-related issues could negatively impact treatment outcomes (Agerwala & McCance-Katz, 2012; Chan, Huang, Bradley, & Unutzer, 2013), whereas psychosocial factors such as access to social support mechanisms could contribute to positive treatment outcomes (Dobkin, De Civita, Paraherakis, & Gill, 2002). The prevalence of co-occurring disorders among justice-involved persons and the potential barriers to treatment and recovery these disorders present (Warren, Stein, & Grella, 2007) contribute to recidivism and enable the drug-crime relationship. An examination of the relationship among psychosocial factors and treatment outcomes contributes to the intersection of public safety and public health which could, in turn, influence decision making practices within the criminal justice system, and drug courts in particular, to better assess individuals who may be eligible for intervention programs and enhance management procedures within programs to improve success (Cheesman, Rubio & VanDuisend, 2004). Since behavioral health disorders account for more disability than any other medical problem (Council [SAMHSA], 2004) an emphasis on services

and treatment could account for cost savings beyond the criminal justice sector and into the public health sector.

Although drug courts have established efficacy for reducing recidivism and relapse rates among adult substance abuse offenders (Belenko, 1998), the focus on crime reduction outcomes with limited focus on mental health outcomes (National Institute on Drug Abuse, 2007) is problematic. Much of the program evaluation research on drug court treatment outcomes focused on drug court processes and while structural information is relevant, meta-analyses of the literature identified a lack of a clear understanding as to how the processes are effective and for whom (GAO, 2005; Mitchell, Wilson, Eggers, & MacKenzie, 2012; Shaffer, 2011; Wilson, Mitchell, & MacKenzie, 2006); studies have failed to provide an explanation as to why drug courts work for some populations and not others (Marlowe, et. al, 2006). The literature demonstrates positive program characteristics (Huddleston & Marlowe, 2011) and demographic characteristics that contribute to program completion (Bhati & Roman, 2010; Bouffard & Richardson, 2007), but results are often mixed (Merrall & Bird, 2009; see Appendix A) and gaps in the literature remain (Stinchcomb, 2010). The question has been do drug courts work and the answer is yes, but the questions as to why and for whom remain ambiguous. Information on the psychosocial characteristics of drug court participants could offer further explanation for the efficacy of drug court treatment. Drug courts are designed to treat non-violent offenders who have committed drug offenses, and while they do not explicitly address mental illness or co-occurring disorders as part of the key components of drug court, it is not unlikely that drug court clients demonstrate mental health or trauma-related symptoms given their prevalence rates among substance abusers. It would be both appropriate and beneficial to develop informed assessment procedures within drug courts to assist with the identification of current mental health symptoms and to direct effective trauma-informed care as unmet mental health care needs are one of the most relevant issues for relapse. Identifying co-occurring, trauma-related disorders or current mental health symptoms, and providing relevant

treatment, could better address the factors related to offending behaviors, which in turn could contribute to better treatment outcomes as well as provide a better understanding as to why drug court treatment works and for whom. Likewise, studying drug court populations that better represent current trends in substance use patterns, i.e., offenders who abuse prescription medication, could contribute to research that examines criminogenic risks (i.e., matching intensity of service to risk level) (Andrews Bonta, 2010; Andrews & Dowden, 1999; Marlowe, et al., 2006).

The following study attempted to explore participant demographics and psychosocial factors within a drug court context. Specifically, an examination of psychosocial factors as predictors of drug court graduation was undertaken to determine the possibility of a negative relationship between traumatic stress, mental health symptom severity, and program success. Also examined was the possibility of a positive relationship between access to prosocial support systems and successful program completion in terms of drug court graduation. The objective was to provide a better understanding of how psychosocial factors influence successful or unsuccessful drug court graduation. The hypotheses guiding this study were that exposure to traumatic stress and resulting mental health symptoms would negatively impact successful drug court graduation and that access to prosocial support systems would positively impact successful drug court graduation. In addition, this study investigated these issues within a sample of prescription drug abusers assigned to medication-assisted drug court treatment, a little studied population in criminological research. The results of this study were intended to provide information regarding the relationship between psychosocial factors and drug court graduation that may provide useful data to better understand for whom drug court works and to possibly reveal important policy implications for addressing the needs of individuals with co-occurring disorders within a criminal justice context. Finally, this study contributes to the literature by shifting the focus from traditional drug-crime research to examining current trends using an interdisciplinary perspective.

Chapter 2: The Criminal Justice and Public Health Burdens of Substance Abuse

Substance abuse, in the forms of both the use of illegal drugs and the misuse of prescription medication, is a pervasive problem in the United States, resulting in a multiplicity of issues for not only the individual drug user, but also for family members, the community, and society as a whole. The social impact of substance abuse has led to a multitude of policies, programs, and sanctions in an effort to “fight the war on drugs”. These strategies have focused on predominately punitive measures in an effort to deter illegal drug activities (manufacture, use/misuse, and distribution) (King, 2008). Drug violations accounted for the largest increase in arrests between the 1980s to present day (Mauer & King, 2007a). In 2005, the largest proportions of arrests were for possession and distribution of illegal drugs, with four out of five arrests being made for possession of illegal substances and one out of five arrests being made for distribution of illegal substances (Belenko, 1998; Mauer & King, 2007b). According to the FBI’s Uniform Crime Reporting (UCR) Program, law enforcement made an estimated 12,408,899 arrests nationwide in 2011; the highest number of arrests, 1,531,251 (8.1%), was for drug-related crimes (UCR, 2011). Of the 1,531,251 arrests in 2011 for drug-related crimes, 1,252,563 (81.8%) were for possession of a controlled substance.

Substance abuse tied to criminal justice involvement is not limited to illegal drugs; even with federal and state level government regulations, the misuse and abuse of prescription medication is a growing problem in the United States. Abuse of prescription medications including opiates, benzodiazepines, stimulants, and other tranquilizers and sedatives is becoming more commonplace (Becker, Fiellin, & Desai, 2007; Johnston, O’Malley, Bachman, & Schulenberg, 2006). Results of the National Survey on Drug Use and Health (NSDUH, 2010-2011) found that 1 in 22 (4.5%) Americans age

12 and older had taken a prescription medication for nonmedical purposes at least once in the year prior to being surveyed (SAMHSA, 2011). The National Center on Addiction and Substance Abuse (Califano, 2005) found that prescription drug abuse rates exceeded rates of cocaine use, heroin use, use of hallucinogens, and use of inhalants combined. The harmful consequences of prescription drug abuse have resulted in an increase in both fatal and non-fatal overdoses (Cai, Crane, & Poneleit, 2010). The Drug Abuse Warning Network has estimated that approximately 25% of emergency room treatment admissions for drug abuse are attributable to prescription drugs (Gibbs & Haddox 2003). The costs associated with the nonmedical use of prescription opiates was estimated at \$53.4 billion in 2006, with criminal justice costs accounting for \$8.2 billion (Hansen, Oster Edelsberg, Woody, & Sullivan, 2011). The Coalition Against Insurance Fraud (2007) estimated the cost of the abuse of prescription pain relievers at \$72.5 billion. The Centers for Disease Control and Prevention has classified prescription drug abuse as an epidemic, and several State and Federal policies have been implemented to address the issue (prescription drug monitoring programs, Medicaid programs aimed at reducing doctor/pharmacy shopping, training for law enforcement) (Paulozzi, Weisler, & Patkar, 2011). Many individuals who abuse illicit drugs and/or misuse or abuse prescription medications are self-medicating untreated psychological issues (Khantzian & Treece, 1985) or use drugs as a coping mechanism for dysphoria (Mueser, Drake, & Wallach, 1998); these issues culminate in individuals engaging in criminal activities to support their addiction. The legitimate uses of prescription drugs (i.e., pain management and substance abuse treatment) affect criminal justice policies and create difficulties in combating misuses and abuse (Schadelbauer & Katz [DEA], 2001); however, arrest rates continue to climb for both illicit drug use and prescription drug crimes (FBI: "Crime in the United States 2011", 2012).

According to the Department of Justice Bureau of Justice Statistics (2007), the prison population in the United States as of 2007 was 2,413,112. Research showed that more than 80% of individuals incarcerated in state prison systems exhibited evidence of serious involvement with drugs

and/or alcohol (Belenko & Peugh, 2005). Studies indicated that an estimated 95% of individuals released from state prison systems with histories of drug abuse resume their drug use upon release (Martin, Butzin, Saum, & Inicardi, 1999) and a large majority will be rearrested, reconvicted, and/or re-incarcerated (Langan & Levin, 2002). Justice-involved individuals with mental illness and substance abuse represent a large majority of the incarcerated population, with 76% of jail inmates accounting for the highest rate followed by state prisoners (74%) and federal prisoners (64%) (James & Glaze, 2006).

To understand the impact of the drug-crime relationship, a consideration of factors other than strictly drug violations in the criminal context is also important. According to Bureau of Justice Statistics (2009) findings, 28% of individuals incarcerated at the federal level and 32% incarcerated at the state level disclosed being under the influence of illicit drugs while committing their crime. Engagement in criminal behavior could be considered as a means to support drug addiction. Furthermore, drug use could influence motivations of individuals who commit crime (see for example, Goldstein, 1985). The Substance Abuse and Mental Health Services Administration (SAMHSA) sponsors an annual measure of drug use in the United States; the National Survey on Drug Use and Health (NSDUH) provides national and state-level data on the use of tobacco, alcohol, illicit drugs (including non-medical use of prescription drugs), and mental health (SAMHSA, NSDUH, 2011). According to the NSDUH, in 2011, an estimated 22.5 million Americans aged 12 or older were current (past month) illicit drug users (SAMHSA, NSDUH, 2011). Table 1 presents results of the 2011 NSDUH according to type of substance.

Table 1. Excerpts from the National Survey on Drug Use and Health 2011

Current users in past month aged 12 or older	Number of persons	Percentage of population
Marijuana	18,100,000	7.0%
Non-medical use of psychotherapeutic drugs	6,100,000	2.4%
Non-medical use of pain relievers	4,500,000	1.7%
Cocaine	1,400,000	0.5%
Hallucinogens	972,000	0.4%
Non-medical use of stimulants	970,000	0.4%
Methamphetamine	439,000	0.2%

Heroin	281,000	0.1%
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Source: NSDUH, SAMHSA, 2011

Substance abuse is a complex social problem, and the best approaches to dealing with justice-involved substance abusing individuals have been argued for decades (Walker, 2006; Wilson & Petersilia, 2002; Garland, 2001; Trebach & Inciardi, 1993). For many years, incarceration was considered the most appropriate method, the focus being deterrence and punishment over rehabilitation (Wexler, 1994). Legislation was enacted for more severe sentences for drug offenders, attributable to societal complaints about the lack of appropriate criminal justice responses to drug crimes (Wexler, 1994). Certain research findings indicated that “nothing works” in terms of rehabilitation, which supported demands for harsher punishments (Martinson, 1974; Warner & Kramer, 2009). Punishment strategies have long been the primary means of drug crime prevention. However, the economic impact of these “war on drugs” strategies is extensive, including increased costs to the judicial and criminal justice systems, a loss of productivity in these sectors, enormous healthcare costs, and personal damages to individuals and families in terms of housing issues (Caulkins & Sevigny, 2005; Mauer, 2003), barriers to education (Mauer, 2003; Correctional Association, 2007), loss of income and healthcare benefits (NIDA, 1992), problems associated with entitlement benefits (Allard, 2002), loss of parental rights, and loss of voting rights (Sentencing Project, 2009) due to drug related arrests and incarcerations, and a drain to social services including child safety investigations and foster care placements among other issues (ONDCP, 2009).

The economic impact associated with drug control policies, particularly within the criminal justice system, (i.e., law enforcement, judicial components, and corrections) coupled with the costs for society (i.e., health care expenditures, productivity losses, and victimization costs), is enormous. In fact, the National Drug Control Budget summary for fiscal year 2013 requested twenty billion dollars for support in the areas of drug abuse prevention (\$1.4 billion), treatment (\$9.2 billion), and domestic law

enforcement (\$9.4 billion) (National Drug Control Strategy: FY 2013 Budget and Performance Summary). According to the National Drug Intelligence Center (NDIC -U.S. Department of Justice), the economic impact of illicit drug use in the United States in 2007 was \$193,096,930. The NDIC (2011) estimates both direct and indirect costs of substance abuse in three areas: crime costs, health costs, and productivity costs. Each of the three principal areas are divided into many components – some of the results of the 2011 report by NDIC on the economic impact of substance use are presented in Table 2(NDIC, 2011).

Table 2. Economic Impact of Illicit Drug Use on American Society

Crime	Economic Impact
Criminal Justice System Costs	\$56,373,254
Crime Victim Costs	\$1,455,555
Other Crime Costs	\$3,547,885
Total Crime Costs	\$61,376,694
Productivity	Economic Impact
Labor Participation Costs	\$49,237,777
Specialty Treatment Costs - State Level	\$2,828,207
Specialty Treatment Costs - Federal Level	\$44,830
Hospitalization Costs	\$287,260
Incarceration Costs	\$48,121,949
Premature Mortality Costs Non-homicide	\$16,005,008
Premature Mortality Costs Homicide	\$3,778,973
Total Productivity Costs	\$120,304,004
Total Health Costs	\$3,723,338

Source: NDIC, 2011

The problem of prescription drug abuse has an even greater burden. After a period of stability of rates of treatment admission for substance use from 1999-2009 for most substances, rates of treatment admission for opiate use increased by 430% over the same time period (SAMHSA, 2011). According to the Drug Abuse Warning Network in 2011, there were over one million emergency department (ED) visits for nonmedical use of prescription drugs (1, 244,872), which accounted for nearly one quarter of all ED visits (26.4%) and half (50.5%) of all drug-related visits. From 2004 to 2011, emergency room department visits related to the abuse or misuse of prescription drugs in the United States increased for all pharmaceuticals by 132%; oxycodone (Oxycontin) related visits increased by

263%, hydrocodone (Vicodin, Norco) related visits increased by 107%, hydromorphone (Dialudid) related visits increased by 438%; and amphetamine-dextroamphetamine (Adderall) related visits increased by 650% (Drug Abuse Warning Network, 2011). Conversely, a less than 1% increase was seen for visits related to the use of methamphetamine, heroin, cocaine, and marijuana (Office of National Drug Control Policy, 2010). According to the Centers for Disease Control and Prevention (2010), the number of deaths due to unintentional overdose of opioid analgesics (prescription painkillers such as Oxycontin and Percocet), were almost twice the number caused by cocaine and five times the number caused by heroin in 2007; increases in the number of unintentional overdose deaths per year involving opioid pain relievers increased nearly four times from 2,900 deaths in 1999 to 11,500 deaths in 2011 (CDC, 2011).

Despite punitive legislation and severe drug policies, drug crimes continue to increase along with economic costs and social welfare burdens. An acknowledgment that the problems associated with substance abuse could not be reconciled through punitive measures has resulted in the consideration of alternative policies and practices to deal with drug offenders (Belenko, 2000). Some recent criminal justice practices have revealed an emphasis on treatment over incarceration, and research has supported a “what works” approach that has proven economic benefits (King & Pasquella, 2009). Substance abuse treatment is one of the major efforts to reduce the societal costs associated with substance abuse, particularly criminal justice costs (Harwood, Hubbard, Collins, & Rachal, 1988). Substance abuse treatment, in both prison-based programs and community services, has evidenced reductions in both substance use and recidivism among offender populations (Zanis, Mulvaney, Coviello, Alterman, Savitz, & Thompson, 2003). There is a need for criminological research to incorporate a behavioral health perspective that focuses on therapeutic justice and psychosocial factors to address the problem of substance abuse. An interdisciplinary approach that emphasizes behavioral health may be

even more important given current trends toward the nonmedical use of prescription drugs and the subsequent criminal justice and public health burdens on society.

Chapter 3: Substance Abuse and the Criminal Justice System: A Behavioral Health Perspective

The connection between substance abuse and crime is well established in the research literature (Incardi, McBride & McCoy, 1997; MacCoun, Kilmer, & Reuter, 2003; MacKenzie & Uchida, 1994; Tonry & Wilson, 1990). Higher rates of substance abuse exist among justice-involved individuals (arrestees, probationers, parolees, and those currently incarcerated) than among individuals who are not justice-involved (ONDCP, 2009). Findings from the Arrestee Drug Abuse Monitoring program revealed that 64% of male arrestees tested positive for at least one of five illicit drugs: (a) cocaine, (b) opioids, (c) marijuana, (d) methamphetamines, and (e) phencyclidine (U.S. Department of Justice, 2000). Criminal behaviors committed by individuals with substance use disorders can range in severity from non-violent crimes such as possession or trespassing to more severe criminal acts such as prostitution, driving under the influence, domestic violence, robbery, assault, and homicide (Bennett, Holloway, & Farrington, 2008). The manufacture and distribution of illegal drugs and the misuse of legal drugs (prescription medication) are also violations of the law that can lead to arrest and incarceration (MacCoun, Kilmer, & Reuter, 2003; White & Gorman, 2000).

Substance abuse is considered a main criminogenic variable within the risk, need, responsivity model of criminal behaviors and is predictive of recidivism (Dowden & Brown, 2002). Drug related crimes coupled with tough on crime stances and policies related to the “war on drugs” have led to increased incarceration rates in jails and prisons across the United States which, in turn, has introduced a large number of offenders with substance use disorders, mental illness, and co-occurring disorders into the criminal justice system (Breslau, Davis, & Schultz, 2003; Finn & Newlyn, 1997). Treatment options for offenders with these problems are limited, and without access to appropriate behavioral

health protocols, this justice-involved population is likely to continue to cycle through the criminal justice system (Center for Health Improvement, 2009).

With rising criminal justice costs and incarceration rates, federal and state criminal justice, mental health care, and substance abuse agencies are examining more effective ways, including utilizing system collaboration, to treat drug addiction among justice-involved populations in order to increase the possibilities of moderating the drug-crime cycle. Pharmacotherapy or medication-assisted treatment (MAT) is one treatment option with proven cost effectiveness and positive therapeutic outcomes; however, MAT has been slow to be adopted within the criminal justice system (AMA, 2008). MAT utilizes medication, such as methadone and buprenorphine in conjunction with counseling and behavioral health services to combat addiction (SAMHSA, 2004). Many opponents to MAT consider it to be substituting one substance for another when in actuality it is a safe and effective means to reduce cravings and limit withdrawal symptoms, while regulating changes in brain chemistry for individuals on maintenance programs (Nester & Malenka, 2004). Jails and prison officials are also reluctant to have “drugs” in their institutions (ONDCP, 1999). However, research findings demonstrate MAT as the most cost effective treatment modality for opioid addiction (CSAT, 2005). Offenders who received MAT while incarcerated demonstrated positive outcomes while detained (total time served) and post-release (decreases in recidivism rates) (Maremmani, Pacini, & Lovrecic, 2004). For offenders under community supervision, research indicated that utilizing drug court treatment that includes medication as part of the community-based treatment service reduces the risks of recidivism (continued criminal behaviors) and relapse (reengagement of illicit and/or nonmedical use of prescription medication) (NIH, 1999; Tomasino, Swanson, Nolan, and Shulman, 2001). Consideration of evidence-based medication-assisted treatment by the criminal justice system as an effective component of rehabilitation is essential to diminishing the drug-crime relationship.

Therapeutic Jurisprudence: Drug Courts

The estimated societal costs of substance abuse was estimated at \$190 billion annually and has extensive repercussions for society as a whole beyond those experienced by the individual abusing drugs (Office of National Drug Control Policy [ONDCP,2011]). The criminal justice system bears the greatest expense of substance abuse due to the costs surrounding adjudication and correctional services (Butzin, Saum, & Scarpitti, 2002; Marlowe, 2010). In an effort to reduce costs associated with processing and incarcerating individuals with not only substance abuse issues, but also mental health or co-occurring disorders and to break the cycle of incarceration due to behaviors associated with these issues, several resourceful judicial solutions have been implemented throughout the United States. A focus on a non-adversarial approach that considers the well-being of the offender and the issues that led to their criminal disposition is the foundation of the legal philosophy known as *therapeutic jurisprudence* (Wexler, 2001). Incorporating therapeutic approaches in criminal justice procedures allows the legal process to attend to individual difficulties that, in turn, impact larger social problems. Therapeutic jurisprudence encompasses such legal components as legislation, criminal justice procedures such as diversion programs (both pre and post-booking), and judicial procedures such as pre-trial interventions.

Therapeutic jurisprudence provides the foundation for drug courts, a judicial means to divert non-violent offenders from traditional criminal justice practices of incarceration or standard probation into treatment programs, thereby receiving treatment for substance abuse or co-occurring mental health disorders that very likely contributed to their criminal justice involvement. Drug courts were developed as instruments of change to address extra-legal factors that influence criminal behavior and contribute to a revolving door of justice where specific groups of offenders regularly cycle in and out of the justice system (Belenko & Dumanovsky, 1993). The initial formation of drug courts, although experimental, was an innovative attempt to combat the greatly increasing correctional population while

focusing on the offenders' underlying issues that contribute to greater social problems. Drug courts offer alternatives to incarceration that impact public safety and improve public health (National Institute of Justice, 2006). The first drug court (DC) was implemented in Miami-Dade County, Florida in 1989; currently, there are over 2,600 drug courts operating throughout the United States (National Institute of Justice, 2012). Many of these specialty courts focus on specific populations of drug offenders such as juveniles and veterans or have specific expectations such as family reunification (GAO, 1995; Goldkamp, White, & Robinson, 2001; Schaffer, 2011; Wilson, Mitchell, & MacKenzie, 2006).

The drug court model operates under a fundamentally different set of standards than typical criminal justice procedures; the prosecutor, defense attorney, judge, and other criminal justice professionals (for example, probation officers) work together using a non-adversarial approach in an effort to break the drug-crime cycle by providing an opportunity for the offender to receive treatment and begin steps towards a prosocial lifestyle (Marlowe, 2003; National Drug Court Institute, 2000; OJP, 2006; Senjo & Leip, 2001). Drug court operations vary according to jurisdiction; however, the drug court model follows a general principle in that it offers court-supervised substance abuse treatment for non-violent offenders to remain in the community instead of being incarcerated in jail or prison. This approach centers on two benefits. First, it provides a public health-focused intervention strategy for the drug-crime relationship that incorporates close criminal supervision with substance abuse treatment as a means to attend to addiction as the cause of criminal behaviors in an effort to reduce recidivism. Second, the drug court approach reduces the burden of the criminal justice system (Hoffman, 1999; Marlowe, et. al., 2006; NADCP, 2011; NIJ, 2006). Post-adjudication drug courts usually require a guilty plea on the part of the defendant, with the understanding that successful completion of the program will result in a suspended sentence, reduced charges, or a dismissal of charges and that failure to comply will result in prosecution (Brown, Allison, Nieto, 2011; King & Pasquarella, 2009). Some drug courts operate under a deferred prosecution model where defendants are not required to plead guilty; under

this type of drug court, jail or prison diversion is offered for first time offenders with the same outcome of prosecution for non-compliance (King & Pasquarella, 2009; Turner et al., 2002). Both post-adjudication and deferred prosecution drug court models usually allow successful graduates to follow procedures to have their records expunged (Nolan, 2002).

Drug courts provide community-supervised substance abuse treatment as an alternative to incarceration for specified treatment lengths depending on jurisdiction; treatment duration ranges from six to eighteen months, with the majority of drug court clients participating in drug court for one year (National Center for State Courts, 2011) The drug court team typically involves the judge, district attorney, defense counsel, drug court coordinator, substance abuse treatment provider, and sometimes a probation officer or other law enforcement official, and/or a social services representative. The judge is the principal member of the drug court team and provides not only sanctions for non-compliance, but also rewards and encouragement for compliance (Harvard Law Review, 1998; NADCP, 1997). Drug court clients (usually labeled as such to avoid terms like “offender” since this is a non-adversarial treatment-based approach) are required to participate in court mandated substance abuse treatment, submit to regular drug screens, and attend regularly scheduled drug court appearances to discuss progress (NADCP, 1997). Additional requirements for drug court clients vary by jurisdiction, but can include required parenting classes, completion of GED or vocational programs, community service, paying child support, or obtaining employment, among other things (National Drug Court Resource Center, 2012). Key components of drug courts according to the National Bureau of Justice Assistance in collaboration with the National Association of Drug Court Professionals are presented in Table 3.

Table 3. Ten Key Components of Drug Court

Component	
1.	Drug court integrates alcohol and other drug treatment services with justice system case processing.
2.	Using a non-adversarial approach, prosecution and defense counsel promote public safety while protecting participants' due process rights.
3.	Eligible participants are identified early and promptly placed in drug court.
4.	Drug court provides access to a continuum of alcohol, drug and other related treatment and rehabilitative services.
5.	Abstinence is monitored by frequent alcohol and other drug testing.
6.	A coordinated strategy governs drug court responses to participant's compliance.
7.	Ongoing judicial interaction with each drug court participant is essential.
8.	Monitoring and evaluation measure the achievement of drug court goals and gauge effectiveness.
9.	Continuing interdisciplinary education promotes effective drug court planning, implementation, and operations.
10.	Forging partnerships among drug court, public agencies, and community-based organizations generates local support and enhances drug court effectiveness.

Source: OJP, 2004

Drug offenders who participated in specialty courts have been found to be more likely to abstain from substance use and to be less likely to be re-arrested than drug offenders in standard probation (Banks & Gottfredson, 2003, 2004; Deschenes, Ireland, & Kleinpeter, 2009; Gottfredson, Najaka, & Kearly, 2003; Gottfredson, Kearly, Najaka, & Rocha, 2007; Roman, Townsend, & Bhati, 2003; Shaffer, 2011; Wilson, et al., 2006). Although much of the research supports the notion that treatment is more likely than traditional forms of adjudication that do not involve treatment to reduce future criminal behaviors among justice-involved substance abusers (Dynea & Sung, 2000; Goldkamp, White, & Robinson, 2001; Spohn & Piper, 2004; Taxman & Bouffard, 2005; Wilson, Mitchell, & MacKenzie, 2006), questions remain as to what types of treatment work best for which types of offenders (Arabia, Fox, Caughie, & Marlowe, 2008; Festinger, Marlowe, Lee, Kirby, Bovasso & McLellan, 2001; Marlowe, DeMatteo, & Festinger, 2004; Taxman & Bouffard, 2005).

Criticism in regard to the research on drug courts identifies two problem areas: insufficient evaluation of drug court procedures and outcomes and methodological issues with drug court studies (Belenko, 2001; Cissner & Rempel, 2005; Finn, 2006; Goldkamp, White, & Robinson, 2001; Shaffer et al., 2010; Turner et al., 2002). For example, in a review of adult drug court research by the Government Accountability Office (GAO) in 2005, only 27 of 117 (23.8%) evaluations of drug court programs were considered to be based on sound methodology (GAO, 2005). The lack of methodologically sound evaluations leaves many remaining questions as to why drug courts work (NDCI, 2006).

In a report that summarized findings from federally funded drug courts, the GAO (2011), established that recidivism rates were lower among drug court participants than among comparison groups. However, there is no standard definition of recidivism within the drug court outcome literature: some studies define recidivism as new arrests (Belenko, 2001, Gottfredson & Exum, 2002; Roman, Townsend, & Bahti, 2003; Spohn, et al, 2001), some define recidivism as new convictions (Spohn, et al., 2001), and other studies define recidivism as new court appearances (Miethe, Lu, & Reese, 2000). Furthermore, the time at which recidivism is measured also varies: some studies measure recidivism during drug court (Belenko, 2011; Gottfredson & Exum, 2002); others measure post-drug court graduation recidivism rates (Miethe, et al, 2000; Spohn, et al., 2001), and some studies measure time to recidivism (Spohn, et al, 2001).

Studies on relapse rates of drug court participants encounter the same lack of a standardized definition of relapse, timeframes of relapse, and how relapse is reported (self-report vs. official data, i.e., urinalysis). In a continuation study of previous research, Gottfredson et al. (2005) utilized self-report data as a measure of relapse and found that drug court participants reported less drug use in the past year than individuals assigned to standard adjudication. The GAO (2011) also indicated that drug court participants were less likely to use drugs than those persons in comparison groups; 56% of drug

court graduates reported drug use as compared to 76% of non-drug court offenders; this report measured both self-reported drug use and urinalysis results.

Overall, outcome studies of drug court completion indicated that certain demographic and criminogenic features affect drug court graduation rates, with drug court graduation correlates including gender, race, age, marital status, level of education, employment status, criminal history, drug of choice, and various drug court characteristics or operations, such as length of time the drug court has been in operation and sanctions applied to the participant. However, much of the literature demonstrates mixed results or contradictory findings (see Appendix A). For example, many studies find no differences between men and women drug court participants in terms of graduation rates (Evans, Li, & Hser, 2009; Hepburn & Harvey, 2007; Marlowe et al, 2003; Seachrest & Shicor, 2001; Senjo & Leip, 2001). In contrast, Belenko's (2001) review of drug court programs found that some studies indicated that men were more likely to complete drug court treatment, but that women were more likely to demonstrate positive outcomes during treatment. One explanation for this gender difference is that women experience more gender-specific issues than men that may interfere with their capability of meeting drug court program requirements, such as having primary caregiver duties that prevent them from attending required meetings (Neal, 2010). Bouffard and Richardson (2007) noted that although outcome studies provide evidence that drug courts work, the research reveals contradictory results in terms of personal characteristics of drug court participants that fail to account for specific issues that impact drug court completion. Their review of the literature indicates that while some research notes certain characteristics such as age to be a predictive factor for completion, other research indicated that the same characteristic results in higher dropout rates (Bouffard & Richardson, 2007).

Outcome study findings in regard to age also present contradictory findings, with some research indicating no difference in drug court graduation according to the age of participants (DeMatteo, Marlowe, Festinger, & Arabia, 2009; Gallagher, 2013; Shaffer et al., 2010) and others demonstrating a

relationship between age and drug court completion (Cissner & Rempel, 2005; Hickert, Boyle & Tollefson, 2009; Young and Belenko, 2002). Still other studies show that age does predict drug court completion, but that directionality matters. For example, in terms of the effect of age on drug court graduation, Hepburn and Harvey's (2007) study found that older drug court participants were more likely to graduate than younger participants; this finding is supported by other research (Hartley & Phillips, 2001, Hickert, Boyle & Tollefson, 2009). Conversely, Senjo and Leip's (2001) study found that younger participants were more likely to complete drug court treatment. These studies demonstrated age as a predictive factor of completion, but failed to account for why age is a factor given that age effects varied across studies.

Studies that examined race as a correlate of drug court completion also found mixed results, with a number of studies indicating that white/Caucasian drug court participants were more likely to complete drug court than participants of other races (Belenko, 2001; Hepburn & Harvey, 2007; Schiff & Terry, 1997; Senjo & Leip, 2001). Other studies found no difference among races in relation to drug court graduation rates (Evans et al., 2009; Peters, Haas & Murrin, 1999). One explanation for this contradiction is that although race can be a factor in drug court completion, other factors can interact with race to influence outcomes (Rempel & DeStefano, 2001; Schaeffer, et. al, 2010).

Studies that examined education had similar contradictory outcomes. Some studies found that level of education was positively related to drug court completion (DeMatteo et al., 2009; Hepburn & Harvey, 2007; Hickert, Boyle, & Tollefson, 2009; Schaeffer et al., 2010; Mullany & Peat, 2008; Schiff & Terry, 1997), while others found no effect (Senjo & Leip, 2001; Hiller, Knight, & Simpson, 1999). In a study by Hickert, Boyle, and Tollefson (2009), the likelihood of successful drug court graduation increased by 15% for each increase in grade level for education attainment. Other studies have found that high school graduates were more likely to successfully complete drug courts when compared to

participants who did not graduate high school or earn their GED (Gray & Saum, 2005; Mullaney & Peat, 2008).

In response to questions regarding contradictory findings of drug court evaluation research, some authors note that interaction effects among program variables or individual level characteristics limit the ability to predict program outcomes and that all findings should be considered cautiously, as results from one drug court evaluation may not be generalizable to all drug courts (Belenko, 2001; Marlow et al., 2004). Despite challenges in assessing the factors that contribute to effective drug courts, there is empirical support that the drug court model reduces recidivism (Banks, & Gottfredson, 2004; Peters & Murrin, 2000; Listwan, Shaffer, Hartman, 2009) and demonstrates positive treatment effects (Lowenkamp, Holsinger, & Latessa, 2005; Wilson, Mitchell, & Mackenzie, 2006). Furthermore, more than one million participants have successfully completed drug court treatment programs (Nolan, 2008). Although there are legitimate methodological issues with drug court outcome studies, there is evidence indicating that drug courts effectively reduce recidivism and relapse regardless of definition or timeframe (Sanford & Arrigo, 2005; Roman, Townsend, & Bahti, 2003). However, research findings on recidivism rates or relapse measures offer little explanation of the characteristics of the participants in these programs to provide a more comprehensive understanding of who successfully completed drug court treatment and why. A determination of whether there are predictable differences between drug court participants who successfully completed mandated treatment and those who do not would better answer questions about how and why drug courts work. A focus on individual level correlates such as mental health, traumatic experiences, and social support could contribute to a more distinctive determination of predictors of drug court completion.

Mental Health Symptoms, Substance Abuse, and Drug Courts

The extant literature on drugs and crime indicates that substance abuse, mental health symptoms, and criminal behaviors both independently and in conjunction with one another expend a

severe social cost for Americans (Levinthal, 2008; Nocon, Berge, Astals, Martin-Santos, & Torrens (2007). The Substance Abuse and Mental Health Services Administration (SAMHSA, 2010) estimates that up to 10 million adults experience co-occurring mental health and substance use disorders in any given year; the term co-occurring disorder (COD) refers to co-occurring substance use (e.g., abuse or dependence) and mental health disorder (DSM-IV-TR, 2000). Co-occurring disorders are diagnosed independently, and clinicians rule out the possibility of multiple symptoms resulting from a single disorder (CSAT, 2006).

Research has demonstrated that individuals with mental illness are at greater risk for developing a substance use disorder (Drake et al., 2001; Gil-Rivas, Grella, & Prause, 2009). Clinical studies found that up to 75% of clients had lifetime co-occurring disorders (CSAT, 2007). Individuals suffering from mental illness experience higher arrest rates than individuals without mental illness and are disproportionately represented in incarcerated populations (Baillargeon, Penn, Knight, Harzke, Baillargeon & Becker, 2009; Lamb & Weinberger 2005; Steadman & Naples, 2005; National GAINS Center, 2001). Many reasons exist for this overrepresentation; however, for most justice-involved individuals with mental illness, the main reason for incarceration is a lack of access to mental health services or other appropriate resources (Cobb, 2006; Draine & Herman 2007, Drapkin, 2003; NTAC, 2002). Steadman et al. (2001) reported that prevalence rates of serious mental illness among jail inmates was estimated at over 7%; this is 2 to 3 times higher than prevalence rates of serious mental illness found in the general population. Legislative policies such as mandatory sentencing and three strikes laws have also, unintentionally, contributed to higher rates of incarceration of mentally ill or co-occurring offenders (Hartwell, 2004). Research findings for co-occurring disorders among incarcerated populations mirror those of clinical studies, indicating that 75% of inmates have co-occurring disorders (National GAINS Center, 2001). A report by the Department of Justice (DOJ, 2006) stated that many justice-involved persons with mental illness have treatable disorders such as major depression, bipolar disorder, and substance use disorders. However, correctional institutions are ill-equipped to properly

address the mental illness and substance use treatment needs of inmates. Although the majority of federal (94%) and state (82%) institutions provided some type of substance abuse treatment (SAMHSA, 2002), many justice-involved individuals go without mental health treatment altogether or without proper integrated treatment for co-occurring disorders that accurately address their issues (DOJ, 2006; Roskes & Feldman, 1999). Unfortunately, jails and prisons have become the main provider of mental health and substance abuse services despite limited capabilities and resources to address the needs of the mentally ill (SAMHSA, 2002 & APA, 2008). Regrettably, due to deinstitutionalization, there are more persons with serious and persistent mental illness who are incarcerated in jails or prisons than in state hospitals (Daniel, 2007).

Findings from the National Survey on Drug Use and Health (SAMHSA, 2011) indicate that among the 18.9 million adults in America with substance use disorder in the past year, 42.3% had a co-occurring mental illness; among those adults without a substance use disorder, 17.6% had a mental illness. In 2011, adults with a mental illness in the past year (25.2%) were more likely to use illicit drugs than adults who did not have a mental illness in the past year (11.2%) (SAMHSA, 2011). This pattern was similar across various types of substance use, including the use of marijuana, cocaine, heroin, hallucinogens, and the nonmedical use of prescription medications. Substance use among adults with mental illness in the past year was highest among those with serious mental illness (31.3%), moderate mental illness (27.3%), and mild mental illness (21.7%), as compared to substance use among adults without mental illness in the past year (11.8%) (SAMHSA, 2011). Mental illness (which typically goes undiagnosed until well into adulthood) most often precedes substance use disorders (Kessler, 2004; Kessler, Berglund et al., 2005); substance abuse may be a means to cope with untreated mental illness or as a mechanism to deal with painful life experiences that may be attributed to an underlying mental illness (i.e., stigmatization, social isolation, poverty, and homelessness) (Henwood & Padgett, 2007; Laudet, Magura, Vogel, & Knight, 2004). The National Survey on Drug Use and Health (NSDUH) found that 10.8 million

adults (4.6%) reported an unmet need for mental health care in the past year; 45.4% of these individuals (4.9 million adults) did not receive any type of mental health services in the past year (SAMHSA, 2011).

The consequences of untreated mental illness and co-occurring disorders may result in a decrease in quality of life, problematic interpersonal relationships, job loss, exposure to trauma and violence, homelessness, and criminal justice involvement (SAMHSA, 2011).

Gil-Rivas, Grella and Prause's (2009) study of individuals with co-occurring disorders found that a significant number of adults entering substance abuse treatment met criteria for co-occurring disorder; individuals with co-occurring disorder had higher rates of recent hospital admissions (psychiatric and medical) and reported more severe psychosocial functioning problems compared to individuals without co-occurring disorders (substance use only) (Gil-Rivas et al., 2009). Gil-Rivas et al. (2009) also established that a large majority of participants experienced trauma and that 35% met criteria for PTSD. Results of this study indicated that traumatic experiences and symptoms of depression and anxiety were associated with an increase in substance use after residential treatment.

Research has also found a relationship between mental health symptoms and nonmedical prescription drug use (NMPDU) (Becker, Fiellin, & Desai, 2007; Becker, Sullivan, Tetrault, Desai, & Fiellen, 2008; O'Brien, 2005; Sullivan, Edlund, Steffick, & Unutzer, 2005), particularly associations between NMPDU and depression (Conway, Compton, Stinson, & Grant, 2006), NMPDU and suicidality (Vidourek, King, & Knopf, 2010), and NMPDU and panic disorder, anxiety disorders, and phobias (Huang, et al., 2006). Individuals suffering from posttraumatic stress disorders are at an increased risk for nonmedical prescription drug dependence (Chilcoat & Breslau, 1998a, 1998b; Tetrault, Desai, Becker, Fiellin, Concato, & Sullivan, 2008). The motivations for nonmedical use of prescription drugs are comparable to the motivations for other illicit drug use, particularly the self-medication hypothesis (Ford & Schroeder, 2009, McCabe, Boyd, & Teter, 2009; Wu, Pilowsky, & Patkar, 2008). In fact, those individuals who choose prescription drugs over other illicit drugs in order to self-medicate report doing

so because of the perceived safety (medicine), dose-response predictability (desirable and undesirable effects are known based on dosage), and the pharmacological specificity (known therapeutic effect for specific symptoms) (Cicero, Inciardi, & Munoz, 2005; Quintero, 2009; Quintero, Peterson, & Young, 2006; Volkow & Swanson, 2003). However, the use of prescription medications without the supervision of a medical professional is dangerous, and individuals who misuse or abuse prescription medication are at an increased risk for accidental overdose, dangerous interactions with other illicit drugs, poisoning that can lead to death, suicidal thoughts or actions, adverse withdrawal symptoms, and tolerance that can lead to increased use and dependence (Hearn, Rose, Wagner, Ciarleglio, & Mash, 1991; Hernandez & Nelson, 2010; SAMHSA, 2004). Understanding psychosocial factors such as mental health correlates of NMPDU is important for targeting criminal justice screens for substance abusing offenders who may benefit from specialized treatment modalities that target specific needs.

Research on the effects of mental health correlates on drug court graduation is limited, but also demonstrates mixed findings. Some studies found no relationship between mental health and drug court outcomes (Dematteo, Marlowe, Festinger, & Arabia, 2009; Cosden, et al, 2006). Other studies did find associations between mental health factors and drug court outcomes (Cissner & Rempel, 2005; Evans, Li, & Hser, 2009; Garrity, et al, 2007; Gray & Saum, 2005; Hickert, et al, 2009; Mendoza, Trinidad, Nochajaski, & Farrell, 2013). Gray and Saum (2005) examined the relationship between mental health, gender, and drug court completion and found that gender (women), race (white), and education (higher levels) were positively correlated with drug court graduation, but that depression, being prescribed a medication for mental health problems, and drug use severity were negatively correlated with drug court graduation. The authors suggest that assessing for mental health symptoms at the time of treatment admission would allow for coordinated services aimed at improving clients' mental health that could subsequently impact treatment progress and increase the likelihood of successful drug court graduation. The findings of Cissner and Rempel's 2005 study indicate that drug court participants with

co-occurring disorder are less likely to complete drug court than those participants without a mental health diagnosis. Additionally, studies have shown that mental health issues are associated with program incompleteness or failure. Evans, Li, & Hser (2009), found that psychiatric conditions measured with the Addiction Severity Index were more prevalent among non-completers than by those individuals who completed drug court. Hickert, Boyle, and Tollefson (2007) found that drug court participants who experienced symptoms of depression were more likely to drop out of treatment than those without symptoms. Finally, Hiller, Knight, and Simpson (1999) found that symptoms of depression, anxiety, and hostility were positively associated with program dropout.

Many studies examine the relationship between mental health and substance abuse (Jacobsen, Southwick, & Kosten, 2001; Hein, Zimberg, Weisman, First, & Ackerman, 1997; Subica, Clypoole, & Wylie, 2012; Triffleman, 2003; Triffleman, Marmar, & Ronfeldt, 1995), substance abuse treatment outcomes in relation to mental health (Ford, Hawke, Alessi, Ledgerwood, & Petry, 2007; Hein, Nunes, Levin, & Fraser, 2000; Ouimette, Finney, & Moos, 1999; Ouimette, Brown, & Najavits, 1998; Petersen, & Zettle, 2009; Schaffer & Najavits, 2007), and treatment models for substance abuse and mental health (Addictions and Trauma Recovery Integration (ATRIUM) [Miller & Guidry, 2001]; cognitive behavioral therapy [Mueser & Fox, 2002; Brady et al., 2001; Donovan et al., 2001]; Seeking Safety [Najavits, 2002, 2007]; Substance-Dependence-Posttraumatic Stress Disorder Therapy [Triffelman, 2000]; Trauma Recovery Empowerment Model [Fallot & Harris, 2002]; The Triad Women's Project [Clark & Fearday, 2003]). However, the research on mental health and drug court outcomes is sparse (Hagedorn & Willenbring, 2003; Garrity, Prewitt, Joosen, Tindall, Webster, & Leukefeld, 2008). More research is needed to examine the relationship between mental health symptoms and drug court outcomes. A better understanding of individual characteristics that could impact successful drug court completion could lead to more effective assessment and treatment interventions targeting specific needs of drug

offenders and/or specific populations experiencing co-occurring disorders (i.e, veterans or domestic violence or sexual assault survivors).

Trauma, Substance Abuse, and Drug Courts

Similar to the effects of mental health disorders, traumatic stress experiences may produce considerable and persistent effects on functioning that can lead to maladaptive coping mechanisms such as substance abuse or dependence. Individuals who experience traumatic stress events in their lifetime may develop trauma-related symptoms that can result in diagnoses of trauma-related disorders such as posttraumatic stress disorder (PTSD) and Acute Stress Disorder (ASD) (Breslau, Davis, & Schultz, 2003; Brown, Campbell, Lehman, Grisham, & Mancill, 2001; Khoury, Tang, Bradley, Cubells, & Ressler, 2010). Long term effects of trauma may also manifest in symptoms of anxiety and depression (Ford, Courtois, van der Hart, Nijenhuis, & Steele, 2005; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999). Additionally, traumatic stress experiences may result in a variety of other internalizing and externalizing behaviors, particularly substance abuse (Breslau, Davis, Peterson, & Schultz, 2000; Stewart, Pihl, Conrod, & Dongier, 1998; Sacks, McKendrick, & Banks, 2008). Recent studies related to substance abuse treatment advised that a lack of trauma assessment and subsequent trauma-informed care when appropriate may result in less comprehensive treatment, consequently decreasing rates of prolonged abstinence after substance abuse treatment completion (Covington, 1999; Hodges, 2003; Najavits, 2003, 2007).

Many symptoms of substance abuse can be associated with the long-term effects of trauma, such as nightmares, mood swings, irritability, and experiencing extreme highs and lows (Covington, 1999); other common symptoms among substance use disorders and trauma are depression, anxiety, and substance abuse (Brier, 1992). Common mental health problems among individuals in substance abuse treatment that may affect treatment outcomes are: anxiety, depression, eating disorders, posttraumatic stress disorder, trauma histories, and suicide attempts (Broner et al., 2002; Haywood et

al., 1995; Henderson, 1998; Owen, 1999; Peters & Hills, 1999; Teplin, Abram, & McClelland, 1996). Individuals who have experienced trauma at any time in their lives are more likely to develop mental health issues and substance use disorders, and many go without treatment for these issues, which may affect their overall functioning (Alexander, 1996; Goodman, Rosenberg, Mueser, & Drake, 1997; CSAT, 2009). Individuals with histories of traumatic stress experiences have a higher likelihood of substance abuse. Their use of drugs and alcohol can be a method of self-medicating to alleviate symptoms associated with trauma and mental illness (Covington, 1999; Najavits, 2004) or as a means to cope with negative feelings associated with or disturbing memories of their trauma (Coffey, Stasiewicz, Hughes, & Brimo, 2006; Najavits, 2007). Trauma is not always addressed in substance abuse treatment, since the focus is on relapse prevention (Hightower, Smith, & Hightower, 2006; Walsh et al., 2007). However, given the strong association between trauma and substance abuse (Brady, Back, & Coffey, 2004; Chilcoat & Breslau, 1998; Chilcoat & Menard, 2003; Dansky, Saladin, Brady, Kilpatrick, & Resnick, 1995; Hien, Cohen, & Campbell, 2005; Karadag, Sar, Tamar-Gurol, Evren, Karagoz, & Erkirian, 2005; Read, Brown, & Kahler, 2004), a key component to successful treatment outcomes may require addressing the trauma.

National prevalence rates for experiences of potentially traumatic events in adults over their lifetime range from 65-80% (Roberts, Gilman, Breslau, Breslau, & Koenen, 2011). Men are more likely than women to experience combat or accident related trauma and women are more likely to experience victimization or the loss of loved ones (Pietrzak, Goldstein, Southwick, & Grant, 2011). Women and men with traumatic stress experiences are more likely to abuse substances (Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997) and are more likely to exhibit symptoms that may affect treatment outcomes such as depression and anxiety (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

Research on the association between trauma and the nonmedical use of prescription medication is scarce, with relatively few studies examining this area. However, the limited findings do

indicate a link between opioid use and psychological distress (Jamison, Butler, Budman, Edwards & Wasan, 2010; Sung, Richter, Vaughan, Johnson, & Thom, 2008). Manchikianti and colleagues (2007) examined psychological factors in opioid and illicit drug use in chronic pain patients and found increased drug abuse among those patients with higher rates of depression, anxiety, and somatization; the researchers noted gender differences, with more women exhibiting signs of depression and subsequent drug abuse and more men exhibiting signs of somatization and subsequent drug abuse. The extant literature also provides evidence of a relationship between women's experiences of sexual assault and NMPDU (McCauley, Amstadter, Danielson, Ruggiero, Kilpatrick, & Resnick, 2009) and increased risk of NMPDU among adolescents with traumatic event histories (McCauley, et al., 2010).

Although information on the relationship between substance abuse (illicit drug use and NMPDU) and trauma is available, information on the prevalence of trauma among drug court participants is scant and information on drug court outcomes in regard to trauma exposure is non-existent. In a study of lifetime trauma exposure and posttraumatic stress disorder in women sentenced to drug court by Sartor, et al., (2012), the authors found that only 29 out of 319 (9%) women did not endorse any traumatic events; 71% had trauma exposure without PTSD and 20% met criteria for PTSD. Although female drug court participants were at a high risk for experiencing traumatic stress, correlations between trauma exposure and other study variables were not accounted for and drug court outcomes in relation to the study variables were not examined (Sartor, et al., 2012).

It is highly likely that a significant number of drug court participants have experienced trauma, and this could impact drug court graduation rates. There is a need for research on the effects of trauma on drug court graduation, as the extant literature is severely limited on this topic. The associations among trauma, substance abuse, and related mental health symptoms are relevant to both the criminal justice entities and treatment providers in that this relationship could negatively impact both criminal recidivism and relapse rates. Research supports that PTSD mediates the adverse effects of trauma

exposure among individuals with co-occurring disorders (Subica, Claypoole, & Wylie, 2012) and that the combination of trauma history and trauma symptoms even without meeting criteria for a PTSD diagnosis can influence addiction relapse (Tate, Brown, Unrod, & Ramo, 2004). Furthermore, research suggests that integrated care that combines treatment for trauma-related symptoms and substance abuse can not only decrease the likelihood of relapse, but also alleviate symptoms of suffering that contribute to substance abuse (Brown, 2000, Cohen & Hien, 2006; Sacks et al, 2008). Incorporating trauma assessment in drug court programs in conjunction with trauma-informed care when necessary could provide answers to some of the whys and hows of effective drug court outcomes. Identifying traumatic stress experiences as a correlate of substance abuse and determining if trauma predicts drug court outcomes could facilitate a better understanding of both individual level characteristics that influence drug court graduation and better explain the interaction effects found in the outcome literature.

Social Support, Substance Abuse, and Drug Courts

Although mental health problems and trauma may adversely affect drug court outcomes, individuals with strong social supports may evidence more positive outcomes. Research on social support has demonstrated the important role that positive social networks, access to personal support systems, and perceptions of social support have in relation to both successful substance abuse treatment and improvements in psychosocial functioning and motivation for recovery (Chao et al., 2013; Chong & Lopez, 2005; Davis & Jason, 2005; Dobkin, De Civita, Paraherakis, & Gill, 2002; Ellis, Bernichon, Yu, Roberts, & Harrell, 2004; Gainey, Peterson, Wells, Hawkins, & Catalano, 1995). House's (1981) sociological research on stress and social supports classified social support behaviors into four areas including emotional support (love, caring, and empathy), instrumental support (tangible needs), informational support (advice and information), and appraisal support (information for self-evaluation). These different types of support can be provided to or for individuals through a variety of social or interpersonal relationships, such as friends, family members, colleagues at work or school

environments, or by community service providers. The functional aspect of social support can be further divided into two domains: enacted or perceived support (Calysn, 2004). Enacted support represents actual support received by an individual, whereas perceived support is the individual's perception of the availability of support, irrespective whether the person receives or accesses the support (Calysn, 2004).

Research findings from studies on substance abuse treatment program outcomes demonstrate that social support consistently predicts effective substance abuse treatment (Zerger, 2002) and contributes to prolonged abstinence from substance abuse (Havassey, Wassserman, & Hall, 1995). Dobkin, De Civita, Paraherakis, and Gill (2002) found higher dropout rates among individuals in outpatient substance abuse treatment who reported low levels of social support. Additional research has shown that substance abuse treatment clients who have positive social relationships are more likely to successfully complete treatment (Watkins, Shaner, & Sullivan, 1999). Laudet, Cleland, Magura, Vogel, and Knight (2004) report that social support for individuals in recovery is most important during the beginning stages of treatment, because individuals may be struggling with abstinence and motivation for change. A study by Warren, Stein, and Grella (2007) also supported this finding; results indicated that the availability of social support when clients entered treatment predicted improvement in substance abuse and mental health outcomes.

Additional research findings indicate that individuals with substance use disorders and low social support had an increased risk for onset of mental illness, demonstrating a relationship between social support and mental health symptoms (Pevalin & Goldberg, 2003). In a study of substance abuse and co-occurring disorders among the homeless, Lam and Rosenheck (1999) found that perceived social support was positively associated with substance abuse treatment and improved mental health outcomes.

There is a dearth of information on the role of social support and treatment outcomes for individuals who misuse or abuse prescription medication; however, the few studies available on MAT for opioid users offer conflicting findings. Smith and Rosen's study (2009) of barriers to social support for older methadone maintenance clients found that past traumatic experiences influenced a lack of trust and self-isolation among clients which the authors concluded could affect abstinence during and after treatment. Kidorf and colleagues (2005) studied a behavioral intervention within a hospital-based medication-assisted treatment program where participants were encouraged to include non-drug using family or friends in their treatment session. The authors found increased rates of abstinence among those clients with access to social support. Finally, Wasserman, Stewart, and Delucchi (2001) found that both structural and functional social support increased abstinence among opioid maintenance patients.

Social connectedness of drug court participants is less accounted for in the research, but the few studies that have examined social interactions (isolation vs. connectedness) found conflicting results. Rempel and DeStefano (2001) found that social isolation of drug court participants in terms of living alone or in socially isolated neighborhoods was not significantly related to program outcomes, but that predictors of general social connectedness, such as employment, being enrolled in school, or having a stable living environment, were positively related to drug court completion. On the other hand, Hickert, Boyle, and Tollefson (2009) found that living alone or in socially isolated neighborhoods had negative impacts on drug court graduation and that drug court participants who spent more time with family were more likely to graduate from drug court treatment than participants who did not spend time with family. Correspondingly, Hiller, Knight, and Simpson (1999) found that although drug court participants were socially connected, their deviant peer networks predicted failure to graduate from drug court. Investigation of the association between social support and treatment outcomes for NMPDU clients is necessary, given the complex relationship between mental health symptoms and substance abuse and

evidence that suggests isolation and loneliness caused by these symptoms could negatively impact successful treatment outcomes.

Research on the association among trauma, mental health problems, substance abuse, and social support demonstrates similar findings in regard to lower levels of social support being associated with negative outcomes and higher levels of social support being related to positive outcomes for both psychosocial functioning and treatment recovery (Ashley, Marsden, & Brady, 2003; El-bassel, et al., 1996). Individuals who have experienced trauma and perceive themselves as having less access to positive social support are more likely to engage in negative coping mechanisms such as substance abuse and are more likely to develop mental health symptoms in relation to their trauma experiences (Cook, et al., 2005; Knight, Logan, & Simpson, 2001). Furthermore, women with trauma and substance abuse histories are more likely to experience negative social and criminal justice outcomes than men in these situations; women with trauma and substance abuse are more likely to live in poverty, be single parents, be at risk for losing custody of their children, and be more likely to engage in criminal activities such as prostitution (Cohen & Hein, 2006; Ehrmin, 2001; Najavits, et al., 1997). These findings emphasize the importance of assessing psychosocial factors such as trauma, mental health symptoms, and access to prosocial supports in order to tailor treatment needs to provide the most benefit for the client as well as society. By examining these psychosocial influences within a drug court context, further information can be gained on factors that influence drug court graduation.

Chapter 4: Research Design and Methods

There is an established research literature on positive findings of alternatives to sentencing programs (Anglin, Douglas, Longshore, & Turner, 1999; Clear & Schrantz, 2011; Miller, 2004), particularly drug court outcomes (Gallagher, 2013; Mitchell, Wilson, Eggers, MacKenzie, 2012; Rempel, Green, & Kralstein, 2012). However, gaps remain in our knowledge of certain factors that influence drug court program success or the lack thereof. In particular, although it is established that involvement in drug court programs increases the likelihood of positive outcomes for justice-involved substance abusers, research demonstrates that these outcomes are not universal and that for some, drug court programs do not work. Questions remain regarding for whom drug courts work. Given the significant social impact and vast criminal justice burden related to substance abusing offenders, a more comprehensive determination of participant characteristics that affect successful drug court completion should be considered. Research demonstrates a significant relationship between negative psychosocial factors such as trauma, mental illness, and substance use (Asberg & Renk, 2012; Belenko, 2006; Kingston & Raghavan, 2009; Lesperance, Moore, Barret, Young, Clark and Ochshorn, 2011; Picken & Tarrier, 2011; Rosenberg, 2011; Stover, MacMahon, & Easton, 2012). Additionally, the literature demonstrates a relationship between positive psychosocial factors and recovery, such as prosocial support systems (Havassy, Hall & Wasserman, 1991; Maguire, 2001; Norris, 2009; Spjeldnes, Jung, Maguire, & Yamatani, 2012). The literature on co-occurring disorders and trauma-informed care emphasizes the need for simultaneous treatment for both mental health or trauma-related symptoms and substance use in order to decrease the likelihood of substance abuse relapses and criminal justice recidivism while providing a therapeutic response to the effects of mental illness and/or trauma (Abbott, 2003; Amaro, Chernof,

Brown, Arevalo, & Gatz, 2007; Dass-Brailsford & Myrick, 2010; Minkoff, 2008; Najavits, Weiss, & Shaw, 1999; Najavits, 2004). This exploratory study utilizes secondary data to examine the demographic and psychosocial factors associated with drug court graduation among a medication-assisted treatment population. Using a variety of measures to assess trauma experiences, mental health symptom severity, and prosocial support in relation to drug court graduation affords a more comprehensive approach to understanding the impact of drug court while accounting for psychosocial factors that may influence substance abuse treatment. Furthermore, research on medication-assisted treatment populations is limited and more information is needed. Studying demographic and psychosocial factors facilitates a further exploration of the question, for whom are drug courts beneficial? The results of this study contribute to the literature on psychosocial factors and their impact on drug court outcomes.

Procedures

The data for this study come from a pre-existing de-identified data set from an evaluation of a medication-assisted drug court treatment program. The Hillsborough County Medication-assisted Drug Court Treatment Program (MADCT) and the external evaluation component were funded through a federal grant by the Substance Abuse and Mental Health Services Administration – Center for Substance Abuse Treatment (SAMHSA-CSAT). The purpose of the MADCT program was to offer offenders with opiate addiction a harm-reduction based outpatient treatment option as an alternative to abstinence-based programs or jail/prison – with the ultimate goal of supporting clients in their efforts to achieve sobriety and stability. Successful treatment completion and compliance with drug court requirements allow first-time drug offenders the opportunity to avoid having a felony conviction upon completion of the program. Secondary data were utilized to assess the effects of psychosocial factors (traumatic stress experiences, mental health symptom severity, and social support) on drug court graduation. It was hypothesized that individuals with higher instances of traumatic stress experiences and more severe mental health symptoms would have less favorable drug court outcomes in terms of successful

graduation, whereas individuals with access to prosocial support systems would have more favorable drug court outcomes in terms of successful graduation.

Data were collected from individuals who were enrolled in a medication-assisted drug court and attending court-ordered substance abuse treatment. Prior to data collection, approval from the University of South Florida Institutional Review Board (IRB) was obtained, and all study personnel completed instruction in human subjects research. Each participant gave informed consent to participate in the evaluation study from which data for this study were used. A modification to the IRB was approved to allow for further analyses using these data to inform this dissertation.

Sample

The sample for this study was composed of participants in the Hillsborough County Medication-assisted Drug Court Treatment (MADCT) Program of the 13th Judicial Circuit, Hillsborough County, Florida. All participants in this program had histories of drug abuse and were opiate users. Drug abuse is characterized by a maladaptive pattern of substance use to the point where the individual experiences significant cognitive and behavioral impairment or emotional distress that has an impact on work, school, or the home (APA, 2000; DSM-IV). Eligibility criteria for the MADCT program included male and female offenders who had: (1) prescription drug-related charges, (2) no history of violent criminal offenses, (3) no diagnosis of severe mental illness, (4) no alleged sexual perpetration, and (5) willingness to participate in medication-assisted drug court treatment. Program participation was voluntary. The MADCT program provided approximately six months of outpatient treatment to individuals who abused or misused prescription opiates. The treatment utilized an evidence-based treatment protocol, the Matrix model, in conjunction with medication-assistance. The Matrix Model utilizes cognitive-behavioral concepts to reinforce positive behavioral changes (Rawson, et. al, 1995 & 2002). MADCT treatment emphasized individual contact with a substance abuse counselor, education about drug abuse, relapse prevention, social support, twelve-step participation, and issues critical to addiction and

relapse. Participants received medication management in the form of methadone or suboxone as part of their substance abuse treatment and were required to attend the clinic daily in order to obtain their medication. All MADCT clients participated in individual and group counseling sessions, weekly attendance at a self-help group meeting, such as Alcoholics Anonymous/Narcotics Anonymous/Methadone Anonymous, one to two random drug screens per week, and monthly judicial reviews. Although most participants completed the treatment component of drug court within six months, the majority remained in drug court for judicial reviews and drug testing up to one year or until they satisfied all of the requirements of the drug court program. Upon successful graduation from the MADCT program, participants' charges were dropped and they were allowed to petition the court to have their records expunged. Individuals who did not satisfy the requirements of the MADCT program were sentenced for their original charges and served jail time. Some participants did not successfully graduate due to absconding from treatment (these had active warrants or were jailed), were incarcerated for charges not related to the charge that led them into the MADCT program, were transferred to a different jurisdiction for criminal justice reasons, or were involuntarily discharged from treatment due to non-compliance.

The sample for the current study was drawn from the population of all individuals who were participants in the MADCT program between January, 2010 and April, 2012. To have their data included in the analysis, participants must have completed all study measures and must have been discharged from the program and their graduation or non-graduation status recorded. Only 108 of the original 145 participants had completed all study measures. Of these 108 who had completed all study measures, 90 had been discharged from the program and were thus eligible for inclusion in the analysis. To ensure the representativeness of the sample, analyses were performed to examine potential demographic differences among the entire drug court population (N= 145), the included sample (n=90), and the excluded sample (n=55, those still active in the drug court program and/or declined to complete all

study measures). No statistically significant differences emerged among any of these groups (see Table 4). In the absence of any significant differences, analyses were restricted to the final sample that were no longer active in drug court and had completed all study measures (N=90).

Table 4. Comparison of Total Population, Excluded, and Final Sample Demographics

		Total Population (N = 145)		Excluded Sample (N = 55)		Final Sample (N = 90)		Significance
		Mean or N	SD or %	Mean or N	SD or %	Mean or N	SD or %	
Covariates	Age	28.15	7.89	28.4	8.36	28.0	7.64	$t(143) = -0.338, p = .736$
	Gender							$\chi^2(1) = 1.088, p = .297$
	Female	79	54.5%	35	63.6%	44	48.9%	
	Male	66	45.5%	20	36.4%	46	51.1%	
	Education							$\chi^2(2) = 5.384, p = .068$
	LT High School	43	29.7%	21	38.2%	22	24.4%	
	High School GT High School	59	40.7%	16	29.1%	43	47.8%	
Employment							$\chi^2(1) = 0.989, p = .320$	
Unemployed	94	64.8%	38	70.4%	56	62.2%		
Employed	50	34.5%	16	29.6%	34	37.8%		

In the final sample used for the present study, there were 44 women (48.9%) and 46 men (51.1%). Participants ranged in age from 18-59 ($X = 28.15, SD = 7.89$). As depicted in Table 4, 22 participants reported their level of education as less than high school (24.4%), 25 reported earning a high school diploma or equivalent GED (27.8%), and 43 participants reported completing some college or more (47.8%). The majority of participants were unemployed at baseline (62.2%).

Research Questions

In order to address the impact of psychosocial factors on drug court graduation, four questions were examined:

- What are the demographic correlates of drug court graduation?

- What is the relationship between individuals' experiences of traumatic stress and drug court graduation?
- What is the relationship between mental health symptom severity and drug court graduation?
- What is the relationship between prosocial support systems and drug court graduation?

Results of the study inform a discussion of whether demographic and psychosocial factors should be considered in alternatives to sentencing programs for justice-involved individuals with substance abuse.

Measures of Variables

Demographics – For the purposes of this study, demographics include the following variables: age (in years), gender (female = 1, male = 0), level of education (measured as less than high school =1, high school or GED equivalent = 2, or some college or college graduate = 3), and employment (measured as employed = 1 or unemployed = 2). These variables were chosen as covariates because extant empirical research has identified these as being predictors of drug court outcomes.

Drug Court Graduation - Participants' drug court graduation status was coded as yes (successful graduation = 1; N = 68) or no (did not graduate = 0; N = 22); this information was provided by the court. MADCT participants are recorded as "graduates" when they complete treatment and satisfy all drug court requirements including regular judicial reviews and drug testing beyond treatment completion. MADCT participants are recorded as "non-graduates" when they fail to meet drug court requirements (completing treatment, attending judicial reviews, no further criminal justice involvement).

Traumatic Stress - Traumatic stress experiences were measured using the Traumatic Stress Scale (TSS), part of the Global Appraisal of Individual Needs (GAIN) instrument (Dennis, White, Titus, & Unsicker, 2006). The Traumatic Stress Scale encompasses a range of exposure(s) to trauma over the lifetime as either a victim or a witness to victimization. The TSS is a 13-item measure of past year symptoms or memories related to past trauma (e.g., post-traumatic stress disorder PTSD), current trauma (e.g., acute stress disorder (ASD) or other disorders of extreme stress (DES or complex PTSD; e.g.

related to on-going childhood maltreatment, battering victims, domestic violence or sexual abuse survivors) associated with exposure to traumatic events. Some examples of items on the TSS are: *When something reminds you of the past, you become very distressed and upset; you had nightmares about things in your past that really happened; you felt guilty about things that happened because you felt like you could have done something to prevent them?* Scores are the sum of “yes” responses, with higher scores indicating more problems related to memories of traumatic events. Scores range from 0-13 and the authors provide guidelines for interpretation based on prior research determining demographic norms (Modisette, Hunter, Ives, Funk, & Dennis, 2009): scores are interpreted as no (0 symptoms endorsed), moderate (1–4 symptoms endorsed), and high (5–13 symptoms endorsed). The TSS is based on the Civilian Mississippi Scale for PTSD (Hyer, Davis, et al., 1991; Keane, Caddell, & Taylor, 1988; King, King, et al., 1993; Kulka, Schlenger, et al., 1991; Lauterbach, Vrana, et al., 1997; Vreven, Gudanowski, et al., 1995). For the present study, the Cronbach’s alpha coefficient of reliability is $\alpha = .934$.

Mental Health Symptom Severity – Mental health symptom severity was measured using the Global Severity Index (GSI), which is based on the Brief Symptom Inventory (BSI; Derogatis, 1982). The BSI is a 53-item measure that assesses common psychological symptoms. The Brief Symptom Inventory is an abbreviated version of the Symptom Checklist-90 (SCL-90). Some examples of items on this measure are: *During the past seven days, including today, how much were you distressed by feeling suddenly scared for no reason; feeling tensed or keyed up; feeling nervous when you are left alone?* Respondents indicate the extent to which each of the 53 problems on the checklist has caused distress over the past 7 days. The BSI uses a 5-point Likert response scale, ranging from (0) *not at all* to (4) *extremely* for each item. The measure evaluates nine primary symptom dimensions: depression, interpersonal sensitivity, anxiety, phobic anxiety, paranoid ideation, somatization, obsessive-compulsive, hostility, and psychoticism. The BSI provides a score of overall mental health functioning called the Global Severity Index (GSI), which provides information on the number of symptoms and intensity of

perceived distress of the individual using the mean of the nine subscale scores. The GSI score was used for analyses in this study. Research indicates it is a useful measure of psychological functioning exhibited during inpatient and outpatient treatment for both males and females (Allen, Coyne, & Huntoon, 1998). For this study, the Cronbach's alpha coefficient of reliability is $\alpha = .956$.

Social Support - Social support was measured using the Social Support Survey Instrument (SSSI; Sherbourne & Stewart, 1991). The SSSI is an 18-item brief, multidimensional, self-report survey of social support. The SSSI consists of four separate subscales: emotional, tangible, affectionate, and positive social interaction. The emotional subscale consists of eight items that relate to guidance and appraisal. The tangible support subscale consists of four items that relate to material support, aid, and reliable alliance. The affectionate subscale consists of three items that relate to attachment and affect. The positive social interaction subscale consists of four items that relate to social integration, belonging, and social companionship. Some examples of items on this measure are: *How often is each of the following kinds of support available to you – someone you can count on to listen to you when you need to talk (emotional subscale); someone to take you to the doctor if you needed it (tangible subscale) someone who shows you love and affection (affectionate subscale); someone to do something enjoyable with (positive social interaction subscale)?* The SSSI also provides a measure of overall social support using a mean score for all 18 items. The overall social support score will be used for analyses in this study. Respondents indicate how often each of the 18 types of support is available to them. The SSSI uses a 5-point Likert response scale, ranging from (0) none of the time to (4) all of the time for each item. For this study, the Cronbach's alpha coefficient of reliability is $\alpha = .967$.

Analytic Plan

This study attempted to determine whether three independent variables related to psychosocial functioning (traumatic stress experiences, mental health symptom severity, and prosocial support) had an effect on drug court graduation (completion or non-completion), when demographic characteristics

(age, gender, level of education, and employment) were held constant. Logistic regression was considered the preferred statistical technique for this type of outcome-based dependent variable, as this method regresses a binary (dichotomous) dependent variable on an independent variable or set of variables to produce an estimate of the odds, or “the relative probability of falling into one of two categories” (Menard, 1995, p.12). Studies using logistic regression commonly begin analyses with bivariate correlations to determine which variables contribute to model fit. Hosmer and Lemeshow (2010) presented this method as an adequate technique for analyses involving a binary outcome because eliminating unproductive variables increases overall model fit. Logistic regression models using a forward stepwise method will be utilized to answer hypotheses related to the links between psychosocial factors and drug court graduation. The use of stepwise methods is debated in the literature (see Hosmer & Lemeshow, 1989; Mundry & Nunn, 2009), but is deemed acceptable when the purpose of the research is the identification of predictors (Hosmer & Lemeshow, 1989; Menard, 2010). All statistical analyses in this study will be conducted using SPSS version 20 for Windows (SPSS, 2012). All statistical tests will be two-tailed, with statistical significance determined based upon an alpha level of 0.05. Even though the hypotheses are not multidirectional, it would be overly confident to assume that the hypotheses are correct and it must be considered that the direction could be the opposite. By using two-tailed tests, the probability is calculated from both tails and the possibility of missing an effect in the other direction is eliminated (BMJ, 1994; Hillenmeyer, 2006; UCLA, 2009).

Research Question 1

Logistic regression was utilized to assess first if there was a relationship between demographic variables (age, gender, level of education, and employment status) and drug court graduation (program completion vs. non-completion). Each of the four demographic variables was entered as steps of the regression to determine whether demographics contribute to the prediction of drug court graduation.

Research Question 2

Logistic regression was utilized to assess next if there was a relationship between traumatic stress and drug court graduation (program completion vs. non-completion) while controlling for demographic variables (age, gender, level of education, and employment status). The demographic variables were entered as covariates into the first step of the regression. The predictor variable (traumatic stress) was entered into the second step of the regression along with the demographic variables to determine whether traumatic stress contributes to the prediction of drug court graduation over and above what demographic covariates account for.

Research Question 3

Logistic regression was utilized to assess whether there was a relationship between mental health symptom severity and drug court graduation (program completion vs. non-completion) while controlling for demographic variables (age, gender, level of education, and employment status). The demographic variables were entered as covariates into the first step of the regression. The predictor variable (mental health symptom severity) was entered into the second step of the regression along with the demographic variables.

Research Question 4

Logistic regression was utilized to assess finally whether there was a relationship between prosocial support and drug court graduation (program completion vs. non-completion) while controlling for demographic variables (age, gender, level of education, and employment status). The demographic variables were entered as covariates into the first step of the regression. The predictor variable (prosocial support) was entered into the second step of the regression along with the demographic variables.

Chapter 5: Results

The purpose of this study was to examine the relationships between demographic characteristics and psychosocial factors of drug court participants and successful or unsuccessful drug court graduation. First, bivariate analyses were conducted to determine the relationships among all of the variables included in the study. Logistic regression was then conducted to examine the effects of the demographic covariates and independent variables on the dependent variable of drug court graduation.

Bivariate Analyses

Table 5 presents descriptive information for the sample according to drug court graduation status. T-tests and Chi-squares were calculated to determine differences between the group that graduated and the group that did not graduate from the drug court program. Although participants in this study demonstrated no marked differences across categories of age and employment according to drug court graduation status (completed vs. did not complete), there was a statistically significant difference in regard to level of education. As depicted in Table 5, for participants who graduated drug court, the majority had completed at least some college (55.9%) by the time of the study. In contrast, among those participants who did not graduate from drug court 45.5% reported less than high school as their highest level of education and only 22.7% reported some college or more. Differences between graduates and non-graduates on scale scores of the independent variables assessing mental health symptom severity, social support, and traumatic stress were not statistically significant. However, differences in scores on social support, particularly the subscale of affectionate support, and traumatic stress were approaching significance. The small size of the sample may have some bearing on this, in

that a larger sample size may have produced statistically significant results at the .05 level; future research should attempt to examine these questions with a larger sample size. The descriptive statistics produced an interesting finding in terms of gender with female drug court clients being unsuccessful in terms of drug court graduation in only eight out of forty four cases (9%) compared to male drug court clients who were not successful in fourteen out of forty six cases (31%).

Table 5. Descriptive Statistics for Selected Sample by Drug Court Graduation

	Total Sample (N=90)	Graduated (N = 68)		Did Not Graduate (N = 22)		Significance
		Mean or N	SD or %	Mean or N	SD or %	
Covariates	Age	28.56	8.367	26.18	4.404	t(88) =1.273, p = .206
	Gender					X ² (1) = 1.828, p = .176
	Female	36	53%	8	36%	
	Male	32	47%	14	64%	
	Education					X ² (2) = 9.254, p = .010*
	LT HS	12	17.6%	10	45.5%	
	HS	18	26.5%	7	31.8%	
GT HS	38	55.9%	5	22.7%		
Employment					X ² (1) = 0.025, p = .875	
Unemployed	42	61.8%	14	63.6%		
Employed	26	38.2%	8	36.4%		
IV	Brief Symptom Inventory – Global Scale Index (IV)	0.73	0.53	0.74	0.60	X ² (88) = -.071, p = .944
	Social Support Survey Instrument - Overall (IV)	3.87	0.90	3.44	1.09	X ² (88) = 1.841, p = .069
	Social Support Survey Instrument – Emotional Support Subscale(IV)	3.76	.98	3.30	1.11	X ² (88) = 1.852, p = .067
	Social Support Survey Instrument – Tangible Support Subscale(IV)	3.92	1.12	3.70	1.26	X ² (88) = .809, p = .421
	Social Support Survey Instrument – Affectionate Support Subscale(IV)	4.12	1.03	3.60	1.31	X ² (88) = 1.945, p = .055
	Social Support Survey Instrument – Positive Social Interaction Subscale (IV)	3.82	1.12	3.32	1.21	X ² (88) = 1.803, p = .075
	TSS (IV)	4.16	4.33	2.27	3.99	X ² (88) = 1.813, p = .073†

*p <.05

In addition to examining the relationships between graduation status and each demographic and psychosocial variable, correlation coefficients were calculated to examine the relationships among all the demographic covariates, independent variables, and dependent variable in this study. Bivariate correlations shown in Table 6 indicated positive correlations between gender and two of the three other demographic covariates (education and employment) and one of the three independent variables (mental health symptom severity). Female drug court participants were more likely to have higher levels of education ($r = .210, p < .05$) and to be employed ($r = .441, p < .01$) than male drug court participants. Higher scores on the BSI, which are indicative of higher mental health symptom severity ($r = .288, p < .05$), were associated with MADCT participants who were female. Results indicated a negative correlation between social support and mental health symptom severity ($r = -.224, p < .05$). Further analysis shows that mental health symptom severity is negatively correlated with the subscales of tangible support ($r = -.230, p < .05$) and positive interaction ($r = -.232, p < .05$). The only variable associated with drug court graduation was education; results indicate that those with higher levels of education were more likely to successfully graduate from drug court ($r = .321, p < .01$). Although none of the bivariate results produced significant findings in terms of the impact of the independent variables on drug court graduation, multivariate analyses were conducted for these complex research questions to determine if further or possibly contradictory results were found. Researchers have indicated that discrepancies among univariate, bivariate, and multivariate statistics where a variable is not significant in the first set of analyses, but becomes significant in the next can be accounted for by: effects of unbalanced sample size, missing data influences, considerable within-group variation compared to between-group variation, and the presence of interaction (Lo, Li, Tsou, & See, 1995).

Table 6. Bivariate Correlations Study Variables

Variables		1	2	3	4	5	6	7a	7b	7c	7d	7e
Demo	1. Age											
	2. Gender (Female)	.137										
	3. Education	.137	.210*									
	4. Employment	.164	.441**	-.114								
Independent Variables	5. Mental Health Symptom Severity (GSI/BSI)	.072	.288**	-.013	.319**							
	6. Traumatic Stress Experiences (TSS)	.126	.141	.020	.160	.141						
	7a. Social Support	-.120	-.059	-.011	-.053	-.224*	-.080					
	b. Emotional Subscale	-.063	-.025	.018	-.038	-.181	-.128	.907**				
	c. Tangible Subscale	-.262*	-.075	-.026	-.016	-.230*	-.088	.824**	.596**			
	d. Affectionate Subscale	-.056	-.023	-.005	-.111	-.183	-.017	.904**	.727**	.748**		
	e. Positive Subscale	-.072	-.106	-.028	-.077	-.232*	.025	.862**	.666**	.663**	.815**	
DV	8. Graduation	.134	.143	.321**	-.017	-.008	.190	.193	.194	.086	.203	.189

*p < .05 ** p < .01

Multivariate Analyses

Research Question 1

Logistic regression was conducted to assess if there was a relationship between demographic variables (age, gender, level of education with “greater than high school” as the reference category, and employment status) and drug court graduation (program completion vs. non-completion). When all four demographic variables were used to predict graduation (see Table 7), only education remained a significant predictor, net of all other factors. Specifically, the exp (b) of .190 indicates that those with more than a high school education (the reference category) are $1.000/0.190 = 5.26$ times more likely than those with less than a high school education to graduate from drug court. Those with a high school education only were not significantly different from those with more than a high school education in their graduation rate, after controlling for age, gender, and employment. Further, neither age nor gender nor employment significantly influenced the probability of graduation from drug court. Together, these demographic covariates account for about 16.8% of the variance in the probability of drug court graduation. Despite education being the only significant demographic predictor of drug court graduation, all demographic variables will be controlled for in each regression model to reduce any effects of variation for each research question.

Table 7. Logistic regression analysis testing the effect of demographic variables on drug court graduation

Independent Variable	B	SE	p	Wald	df	Exp (B)
Age	.036	.039	.358	.846	1	1.037
Gender (male)	-.478	.612	.435	.609	1	.620
Education: Less than High School (versus More than HS)	-1.660	.670	.013*	6.130	1	.190
Education: High School Only (versus More than HS)	-.955	.663	.149	2.078	1	.385
Employment (employed)	.207	.627	.742	.808	1	1.230

*p <.05; R²=.168

Research Question 2

A logistic regression analysis was conducted next to test the hypothesis that drug court clients with higher levels of traumatic stress experiences would have less successful drug court outcomes in terms of graduation. Demographics were controlled for by entering the covariates in Step 1 of the logistic regression. The independent variable, traumatic stress, was entered in Step 2. The Hosmer and Lemeshow test of model fit showed a good model fit $\chi^2(8) = 6.382$, $p = .605$. As Table 8 demonstrates, the results of the final model (Wald = 2.907, $p = .088$) suggest that higher levels of traumatic stress experiences did not affect drug court graduation. Nagelkerke's R square showed that traumatic stress combined with demographics accounted for 21.4% of the total variance as compared to 16.8% in step 1 with only the demographic covariates entered.

Table 8. Logistic regression analysis testing the effect of traumatic stress on drug court graduation controlling for demographics (using TSS as measure of trauma)

Independent Variable	B	SE	<i>p</i>	Wald	df	Exp (B)
Age	.031	.039	.423	.643	1	1.031
Gender (male)	-.516	.620	.406	.692	1	.597
Education: Less than High School (versus More than HS)	-1.722	.677	.011*	6.474	1	.179
Education: High School Only (versus More than HS)	-1.010	.670	.132	2.271	1	.364
Employment (employed)	.340	.641	.596	.692	1	.405
Traumatic Stress Scale	.114	.067	.088	2.907	1	1.121

* $p < .05$; $R^2 = .214$

Considering that perhaps this null result was due to the manner in which the TSS is scored, the variable was recoded from a continuous variable to a categorical variable based on the cut off scores provided by the authors of the measure that indicate low/no, moderate, or high traumatic stress experience. Figure 1 illustrates that the variables are not normally distributed regardless of how the variable is measured; logistic regression does not require the variables to be normally distributed, just the error terms (Burns & Burns, 2008). Logistic regression was run again (see Table 9) with the re-coded variable. Although the Hosmer and Lemeshow test of model fit showed a good model fit $\chi^2(8) = 7.143$, p

= .521, the influence of this alternative measure of traumatic stress on drug court graduation after controlling for demographics was not statistically significant. Nagelkerke's R square showed that this measure of traumatic stress combined with demographics accounted for 22% of the total variance in the probability of drug court graduation.

A further consideration as to why the effect of traumatic stress on graduation was not significant was that perhaps the measure of trauma, which relied on memories of past events, was too far removed in time from graduation status. Participants in the study also completed the Posttraumatic Stress Disorder Checklist- Civilian Version at baseline (PCL), which consists of 17 items that indicate how much distress a trauma symptom has caused in the past 30 days. For this study, the Cronbach's alpha score for the PCL measure was $\alpha = .91$. An additional logistic regression analysis (see Table 10) was conducted to test the hypothesis that drug court clients with higher levels of traumatic stress experiences would have less successful drug court outcomes in terms of graduation. Demographics were controlled for by entering the covariates in Step 1 of the logistic regression. The independent variable, traumatic stress as measured by the PCL, was entered in Step 2. The Hosmer and Lemeshow test of model fit showed a good model fit $X^2(8) = 3.846, p = .871$. The results again suggested that higher traumatic stress experiences, as measured by the PCL, did not have an influence on successful drug court graduation. Nagelkerke's R square showed that the model including demographics and the PCL measure accounted for only 18% of the total variance in drug court graduation.

Figure 1. Comparison of Distribution of Trauma Scores

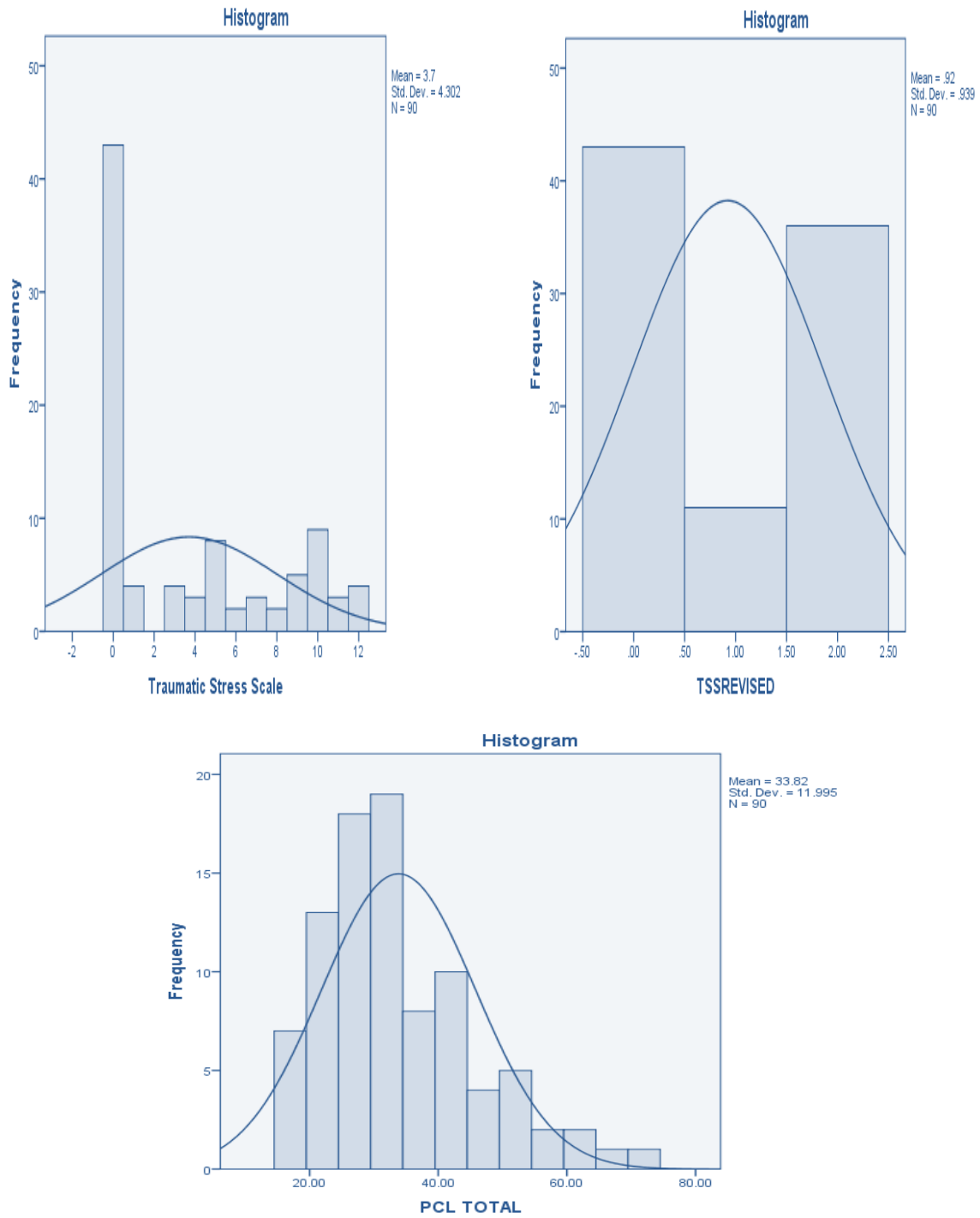


Table 9. Logistic regression analysis testing the effect of traumatic stress on drug court graduation controlling for demographics (using TSS Revised as measure of trauma)

Independent Variable	B	SE	<i>p</i>	Wald	df	Exp (B)
Age	.027	.039	.485	.487	1	1.028
Gender (male)	-.459	.619	.458	.550	1	.632
Education: Less than High School (versus More than HS)	-1.655	.676	.014*	5.999	1	.191
Education: High School Only (versus More than HS)	-1.004	.672	.135	2.230	1	.366
Employment (employed)	.364	.640	.570	.322	1	1.438
Traumatic Stress Scale Revised	.573	.315	.069	3.301	1	1.773

**p* < .05; $R^2 = .220$

Table 10. Logistic regression analysis testing the effect of traumatic stress on drug court graduation controlling for demographics (using PCL as measure of trauma)

Independent Variable	B	SE	<i>p</i>	Wald	df	Exp (B)
Age	.032	.039	.414	.667	1	1.033
Gender (male)	-.636	.650	.328	.956	1	.529
Education: Less than High School (versus More than HS)	-1.680	.674	.013*	6.221	1	.186
Education: High School Only (versus More than HS)	-.979	.666	.141	2.166	1	.376
Employment (employed)	.061	.655	.926	.009	1	1.063
Posttraumatic Stress Checklist	-.022	.025	.372	.795	1	.978

**p* < .05; $R^2 = .180$

Research Question 3

A logistic regression analysis was conducted next to test the hypothesis that drug court clients with higher levels of mental health symptom severity would have less successful drug court outcomes in terms of graduation. Demographics were controlled for by entering the covariates in Step 1 of the analysis. The independent variable, mental health symptom severity, was entered in Step 2. The Hosmer and Lemeshow test of model fit showed a good model fit $X^2(8) = 4.965$, $p = .761$. As Table 11 demonstrates, the results of the final model (Wald = .075, $p = .784$) suggest that higher levels of mental health symptom severity did not affect drug court graduation. Nagelkerke's R square showed that

mental health symptom severity combined with demographics accounted for 16.9% of the total variance as compared to 16.8% in step 1 with only the demographic covariates entered.

Table 11. Logistic regression analysis testing the effect of mental health symptom severity on drug court graduation controlling for demographics

Independent Variable	B	SE	<i>p</i>	Wald	df	Exp (B)
Age	.036	.039	.355	.856	1	1.037
Gender (male)	-.519	.633	.412	.672	1	.595
Education: Less than High School (versus More than HS)	-1.651	.671	.014*	6.054	1	.192
Education: High School Only (versus More than HS)	-.964	.664	.146	2.110	1	.381
Employment (employed)	.182	.635	.775	.082	1	1.199
Mental Health Symptom Severity	-.147	.536	.784	.075	1	3.561

**p* < .05; $R^2 = .169$

Research Question 4

A logistic regression analysis was conducted next to test the hypothesis that drug court clients with higher levels of access to prosocial support would have more successful drug court outcomes in terms of graduation. Demographics were controlled for by entering the covariates in Step 1 of the logistic regression. The independent variable, access to prosocial support systems (Overall Social Support), was entered in Step 2. The Hosmer and Lemeshow test of model fit showed a good model fit $\chi^2(8) = 4.965$, $p = .761$. As Table 12 demonstrates, the results of the final model (Wald = .378, $p = .036$) suggest that higher levels of access to prosocial support systems did have a relationship with drug court graduation. Nagelkerke's R square showed that this variable accounted for 23.4% of the total variance as compared to 16.8% in step 1 with only the demographic covariates entered. The results indicate some support for the notion that individuals with higher levels of access to prosocial support systems are more likely to successfully graduate from drug court.

Table 12. Logistic regression analysis testing the effect of access to prosocial support on drug court graduation controlling for demographics

Independent Variable	B	SE	<i>p</i>	Wald	df	Exp (B)
Age	.044	.039	.261	1.262	1	1.045
Gender (male)	-.657	.643	.307	1.044	1	.519
Education: Less than High School (versus More than HS) Education: More than High School versus Less than High School	-1.984	.696	.016*	5.847	1	.186
Education: High School Only (versus More than HS)	-1.203	.697	.084	2.979	1	.300
Employment (employed)	.286	.653	.661	.192	1	1.331
Overall Social Support	.607	.290	.036*	4.378	1	1.835

**p* < .05; $R^2 = .234$

To further explore the relationship between prosocial support and drug court graduation, additional analyses were conducted using the separate scales of the Social Support Survey Instrument to determine which type of support had the greatest influence on drug court graduation. In separate models, the overall scale was replaced by adding in each subscale. Table 13 shows the results of logistic regression analysis using the emotional support subscale of the Social Support Survey Instrument in the second step of the model; the demographic covariates were entered in the first step. The Hosmer and Lemeshow test of model fit showed a good model fit for the overall model $\chi^2(8) = 8.725$, $p = .366$. The results of the final model using the first subscale, Emotional Support (Wald 3.834, $p = .050$), suggest that higher levels of access to emotional support was moderately related to successful drug court graduation, net of the effects of demographic characteristics. Nagelkerke's R square showed that this variable, along with the demographic variables, accounted for 22.5% of the total variance as compared to 16.8% in step 1 with only the demographic covariates entered.

An additional logistic regression was conducted for the second subscale of the SSSI. As Table 14 demonstrates, the Tangible Support subscale of the SSSI was not a significant predictor of drug court graduation (Wald 1.703, $p = .192$) when demographic variables were controlled. Nagelkerke's R square

showed that this model accounted for 19.3% of the total variance as compared to 16.8% in step 1 with only the demographic covariates entered.

Table 15 shows the results of logistic regression analysis using the Affectionate Support subscale of the SSSI. The results of the final model using this scale (Wald.158, $p = .041$) suggest that higher levels of access to affectionate support was related to successful drug court graduation, controlling for demographic variables. Nagelkerke's R square showed that this model accounted for 23.1% of the total variance as compared to 16.8% in step 1 with only the demographic covariates entered.

A final logistic regression was conducted with the last subscale of the SSSI, Positive Social Interaction. As Table 16 demonstrates, the results of the final model (Wald = 4.413, $p = .036$), suggest that higher levels of access to positive social interaction is related to successful drug court graduation, controlling for demographics. Nagelkerke's R square showed that this variable, along with the demographic variables, accounted for 23.5% of the total variance as compared to 16.8% in step 1 of the model with only the demographic covariates entered.

Table 13. Logistic regression analysis testing the effect of the emotional support subscale of the Social Support Survey Instrument on drug court graduation controlling for demographics

Independent Variable	B	SE	p	Wald	df	Exp (B)
Age	.039	.039	.318	.995	1	1.040
Gender (male)	-.601	.628	.339	.913	1	.549
Education: Less than High School (versus More than HS)	-1.663	.693	.016*	5.760	1	.190
Education: High School Only (versus More than HS)	-1.164	.697	.095	2.791	1	.312
Employment (employed)	.262	.641	.683	.167	1	1.300
Emotional Support Subscale	.527	.269	.050*	3.384	1	1.694

* $p < .05$; $R^2 = .225$

Table 14. Logistic regression analysis testing the effect of the tangible support subscale of the Social Support Survey Instrument on drug court graduation controlling for demographics

Independent Variable	B	SE	<i>p</i>	Wald	df	Exp (B)
Age	.048	.040	.228	1.450	1	1.09
Gender (male)	-.592	.630	.347	.883	1	.553
Education: Less than High School (versus More than HS)	-1.643	.677	.015*	5.987	1	.193
Education: High School Only (versus More than HS)	-1.052	.676	.120	5.888	1	.349
Employment (employed)	.304	.643	.637	2.423	1	1.355
Tangible Support Subscale	.313	.240	.192	1.703	1	1.368

**p* <.05; R^2 =.193

Table 15. Logistic regression analysis testing the effect of the affectionate support subscale of the Social Support Survey Instrument on drug court graduation controlling for demographics

Independent Variable	B	SE	<i>p</i>	Wald	df	Exp (B)
Age	.040	.040	.313	1.019	1	1.041
Gender (male)	-.513	.635	.420	.651	1	.599
Education: Less than High School (versus More than HS)	-1.734	.700	.013*	6.131	1	.177
Education: High School Only (versus More than HS)	-1.229	.696	.077	3.120	1	.293
Employment (employed)	.137	.653	.834	.044	1	1.147
Affectionate Support Subscale	.493	.242	.041*	4.158	1	1.637

**p* <.05; R^2 =.231

Table 16. Logistic regression analysis testing the effect of the positive social interaction subscale of the Social Support Survey Instrument on drug court graduation controlling for demographics

Independent Variable	B	SE	<i>p</i>	Wald	df	Exp (B)
Age	.042	.041	.299	1.077	1	1.043
Gender (male)	-.709	.659	.282	1.160	1	.492
Education: Less than High School (versus More than HS)	-1.699	.696	.015*	5.956	1	.183
Education: High School Only (versus More than HS)	-1.145	.685	.095	2.793	1	.318
Employment (employed)	.277	.664	.677	.174	1	1.319
Positive Social Interaction Subscale	.504	.240	.036*	4.413	1	1.656

**p* <.05; R^2 =.235

Summary of Results

To answer the four research questions presented in this study, logistic regression analysis was conducted to examine the impact of three independent variables, traumatic stress, mental health symptom severity, and prosocial support on drug court graduation, controlling for four demographic variables: age, gender, education, and employment. Prosocial support was further examined by four subscales: emotional support, tangible support, affectionate support, and positive social interaction. The results demonstrated that the majority of the demographic covariates were not predictors of drug court graduation. However, a higher level of education, specifically having at least some college, was found to be associated with successful completion of medication-assisted drug court treatment when compared to those participants who had less than a high school education.

Research question two examined the relationship between traumatic stress experiences at baseline and the dependent variable of drug court graduation and found no significant relationship. Additional regression analyses were conducted using a recoded variable and an alternative measure of trauma and results were still insignificant.

Research question three examined the relationship between mental health symptom severity at baseline and drug court graduation; the relationship was not significant. Research question four examined the relationship between access to prosocial support at baseline and drug court graduation; the results were significant. Additional logistic regression analyses were conducted to examine different types of prosocial support using the subscales of the measure and found that emotional support, affectionate support, and positive social interaction were significantly related to drug court graduation, whereas tangible support had no impact on drug court graduation. The implications of these results are addressed in the discussion.

Chapter 6: Discussion

The study of drug court processes and outcomes has garnered increased attention within the research literature (Belenko, 2001; Dannerbeck, Harris, Sundet, & Lloyd, 2006; Finigan, 2009; Mitchell, Wilson, Eggers, & MacKenzie, 2012; Zweig, et al., 2011). To expand consideration of the factors that influence drug court graduation, this dissertation examined three independent variables deemed relevant to graduation from medication-assisted drug court treatment. This study explored the association of trauma experiences, mental health symptoms, and social support, while controlling for four demographic variables (age, gender, employment, and level of education), with drug court graduation. Evaluations of drug court outcomes have provided evidence that participation in such programs is beneficial for society and offenders in terms of recidivism, relapse, and related cost savings (King & Pasquarella, 2009; Marlowe, 2010; Rossman, Roman, Zweig, Rempel, & Lindquist, 2011; Sechrest & Shichor, 2001; Taxman & Bouffard, 2002). However, the majority of outcome studies have focused on structural-level processes within the court system that produce these effects with little examination of individual-level effects. In particular, investigation of psychosocial factors remains largely unexplored. Furthermore, research examining opioid offenders and medication-assisted treatment within drug courts is scarce, despite rapidly increasing rates of the nonmedical use of prescription drugs. This research adds to the literature on drug courts, as well as to the literature on nonmedical use of prescription drugs, by including measures of psychosocial factors in an analysis of drug court graduation among medication-assisted drug court treatment clients. The results of this analysis indicate that pre-program factors in terms of certain demographic characteristics (education level) influence successful drug court completion and that social support is an important predictor of drug court graduation.

However, the effects of other demographic characteristics (age and employment) and psychosocial factors (trauma and mental health symptoms) had no impact on drug court graduation.

Demographic Variables – Findings and Implications

The first research question of this study focused on describing the demographic characteristics of the sample in terms of age, gender, education level, and employment at baseline assessment in comparison to drug court graduation. The literature documents these factors as being predictive of drug court outcomes, albeit with inconsistent results. Previous research findings have supported the suggestion that younger drug court clients are less likely to successfully complete drug court programs (Dannerbeck, Harris, Sundet, & Lloyd, 2006; Hickert, Boyle, & Tollefsen, 2009; Logan, Williams, Leukefeld, & Minton, 2000; Saum, Scarpitti, & Robbins, 2001), while another study found that younger participants were more likely to graduate (Senjo & Leip, 2001). Others researchers found no age effect (Gray & Saum, 2005; Miller & Shutt, 2001). The average age of drug court clients in this sample was 28 for those participants who graduated and 26 for those who did not graduate; this is consistent with national rates that found mean ages (when reported) between 28 and 33 (Brown, 2010). Consistent with some research findings (Roll, Pendergast, Richardson, Burdon, & Ramirez, 2005; Schiff & Terry, 1997), age was not a significant predictor of drug court graduation in this study and was not correlated with the other variables in the study.

Within the criminological research, there is the theoretical notion of a developmental course of criminal behaviors with some researchers positing the existence of career criminals (Blumstein & Cohen, 1979; Piqero, Farrington, & Blumstein, 2003), others differentiating life course persistent versus adolescent limited offending behaviors (Moffitt, 1993, 1994), and still others stating that all offenders will eventually age out of criminality (Hirschi and Gottfredson, 1983; Sampson & Laub, 2003). The only consensus as to the age-crime relationship is that there seems to be some type of both individual-level and contextual-level correlates operating to continue with or desist from further criminal behavior and

that examining within-individual continuity over time is important to understand this relationship (Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi, 1998; Moffitt & Caspi, 2001; Sampson & Laub, 2003). Comparable to the criminological literature, a tangible method through which age could be operating on drug court graduation is unclear from the larger body of drug court research and impossible to determine from the results of this study. The lack of an effect from age could be due to the small amount of variation in age among clients in this particular drug court. Given the inconsistent findings within drug court research for age as a predictor of drug court graduation, research should continue to examine this factor, particularly in relation to other variables and with a stronger theoretical background to determine links. Moreover, longitudinal studies of long-term recidivism and relapse rates after drug court graduation are scarce within the literature and this type of study could better explain age effects.

Another perspective on the age-crime relationship within the criminological literature is that of Sampson and Laub (1993), who suggested that the association is a function of participation within conventional institutions within society, such as marriage and employment. Future studies should consider if an age effect is present while controlling for other individual and contextual level factors. Furthermore, age is an important factor in the nonmedical use of prescription drugs, with younger individuals more likely to misuse and abuse pharmaceuticals than older individuals (Herman-Stahl, Krebs, Kroutil, & Heller, 2007). Further research should examine age as a factor among NMPDU populations and how that might impact use patterns, criminal justice experiences, and treatment outcomes. For example, within the criminological literature, Ford & Schroeder (2009) examined NMPDU in a college sample and identified general strain theory as supporting findings of use patterns; future studies should expand on this and apply criminological theory to recent trends in drug use and crime to better explain drug court outcomes. A stronger theoretical examination of pathways of the drug-crime relationship in reference to NMPDU could have important practical benefits in terms of criminal justice

processing, i.e., assessing risk and protective factors for criminal behavior could impact alternative to sentencing programs and treatment options within a drug court framework.

In addition to examining age as a demographic factor predictive of drug court graduation, the role that gender plays in successful drug court treatment was also explored in this study. Bivariate results indicated a gendered effect in terms of drug court graduation, with more women successfully completing the program than men; however, when other demographic factors were controlled for in the statistical model, this finding was no longer relevant. Within the drug court literature, findings are again mixed in terms of the effect of gender on graduation. Some research suggests that female drug court participants have better outcomes than male participants (Gray & Saum, 2005; Dannerbeck, Harris, Sundet, & Lloyd, 2006; Hartman, Johnson Listwan, & Koetzle Shaffer, 2007), while others have found no differences between male and female participants in terms of drug court outcomes (Brown et al., 2011; Evans et al., 2009; Peters et al., 1999; Rempel et al., 2003; Young & Belenko, 2002). Some studies have indicated that female drug court participants are more motivated to complete treatment than their male counterparts and others have suggested that women experience unique external factors that influence drug court graduation, such as the threat of losing custody of their children (Dakof et al., 2010; Webster et al., 2006), childcare issues that impact treatment (Butzin, Saum, & Scarpitti, 2002), and lack of specific services directed at women (Schaffer, Hartman, & Listwan, 2009).

Feminist perspectives within the criminological literature propose gendered pathways of crime and deviance, which in turn affect rehabilitative outcomes. Daly (1994) proposes five pathways to crime for women, all of which incorporate psychosocial factors: street women characterized by extensive criminal histories, abusive childhoods, lower levels of education, and involvement in the welfare system (Daly, 1994; Morash, 2006), harmed/harming women characterized by experiences of physical and/or sexual abuse and/or neglect, with related psychological problems and a lack of coping skills that lead to substance abuse and violence (Daly, 1994; Morash, 2006); battered women characterized by limited

criminal histories with substance abuse often preceded by traumatic experiences (Daly, 1994; Leverentz, 2006; Morash, 2006); drug-connected women characterized by substance abuse that is highly impacted by their interpersonal relationships with men who lead them into drug use and crime (Daly, 1994; Morash, 2006); and economically motivated women characterized by criminal activities based on greed or poverty (Daly, 1994). These pathways to criminal behavior for women could also impact treatment outcomes without specific programming that addresses their particular criminogenic risk and protective factors. The literature on rehabilitative procedures and evidenced-based practices is slanted toward males with less attention given to the determination of effective interventions for female offenders (Belknap, 2007; Hubbard & Matthews, 2008; Palmer & Hollin, 2007). An examination of gender-specific or gender-responsive needs could better explain gender effects of drug court graduation as well as their correlation with other variables. Utilizing feminist perspectives within criminological theory to further study drug court clients could influence more research on gendered treatment programming and drug court outcomes.

Additional investigation of recent trends in the drug-crime relationship in regard to gender could yield more specific information important to recent trends in drug use patterns. The criminological literature notes that men commit more crime than women (Steffensmeier, 1996; Lauritsen, Heimer, & Lynch, 2009); however, women are more likely to be arrested for drug crimes than any other crime (Bloom, Owen, & Covington, 2005). Furthermore, although men and women share some of the same traits in terms of criminality, such as lower socioeconomic status, lower levels of education, and problematic interpersonal relationships (Liang & Long, 2013; Heimer, 2000), certain factors are more likely to predict criminal behavior among women than men (histories of abuse, trauma experiences, and mental health issues) (Belknap, 2001; Chesney-Lind & Pasco, 2004). These gender-sensitive factors could also impact drug use patterns and treatment outcomes for women and require further investigation within the drug court literature. Lastly, the literature on the role of gender and the

nonmedical use of prescription drugs indicated varied results (McCabe, Teter, Boyd & Knight, & Weschler 2005; Weyandt et al., 2009) and deserves further attention to assess the impact of gender on drug court graduation among this population

A recent meta-analysis of drug court outcomes indicated a relationship between employment and drug court performance (Zweig, et al., 2011). The results of this study did not support this finding. Employment status did not significantly predict drug court graduation. However, given research within the drug court literature as well as in the behavioral healthcare literature that indicates that this is an important factor in treatment outcomes, future studies should examine this factor to determine its utility in drug court programming. The lack of an employment effect in this study could be a result of the participants having high levels of access to prosocial support systems; clients could be focusing on treatment while being supported in ways that negate an influence of employment status.

Similar to the other demographic variables studied, level of education and drug court outcomes demonstrate mixed findings in the research. The majority of studies find a positive relationship between higher levels of education and drug court performance (DeMatteo et al., 2009; Hickert et. al, 2009; Mullany & Peat, 2008; Shaffer et al., 2010; Schiff & Terry, 1997); the results of this study are consistent with these findings. Drug court clients in this study with higher levels of education were more likely to graduate from drug court than those clients without a high school diploma. Some of the drug court literature has produced findings with no education effect (Senjo and Leip, 2001a; Hepburn & Harvey, 2007; Hiller et al., 1999), and future studies should examine whether controlling for other significant variables accounts for the discrepancies. However, the education effect remained constant in this study even when other demographic factors were included in the model; nonetheless, other factors that were not included in these analyses could account for some variation. For instance, criminological research demonstrates links between socioeconomic status and level of education that influences criminal behaviors and this association could influence this relationship among drug court clients.

Future studies should include socioeconomic status and criminal histories when examining level of education as a predictor of drug court outcomes.

It should be noted that race was not examined in this study due to insignificant variance for this demographic among the sample. However, history has shown that certain criminal justice policies and rehabilitative correctional practices have led to disproportionate arrest rates and unequal access to resources for racial and ethnic minorities (and class and gender inequalities as well) (Lutze, & VanWormer, 2007) and drug court findings on race follow this trend. Within the drug court literature, numerous studies have examined the relationship between race and drug court outcomes and found significant differences between graduation rates of white and non-white drug court clients (Belenko, 2001; Fradella, Fischer, Kleinpeter, & Koob, 2009; Hartley & Phillips, 2001). Dannerbeck and colleagues (2006) found that white drug court clients were more likely to graduate from drug court (55%) than black drug court clients (28%). Belenko's (2001) meta-analysis on drug court outcomes also found that whites are more likely to have successful drug court outcomes than non-whites, but there is a lack of consensus in the literature as to why this race effect is found. Race is an important topic within the drug-crime literature and should be further examined among drug court participants and NMPDU offenders in particular. The "war on drugs" contributed to disproportionate arrest rates among black males for drug offenses (Beckett, Myrop, Pflingst, & Bowen, 2005; Beckett & Sasson 2004; Blumstein, 1993; Reinerman and Levine 1997). These patterns increase every year, yet the rates of black drug offenders participating in drug court programs remains historically lower than the rates of white participants (Fradella, Fischer, Kleinpeter, & Koob, 2009; Miller & Shutt, 2001; Sechrest & Shicor, 2001). Underlying factors related to social disorganization, racism and poverty, and pathways to drug of choice could be influencing criminal justice responses to black drug offenders. Individual-level predictors of drug use patterns (Baumer, 1994; Duster, 1997) and drug court participation (Dannerbeck, -Kanku, & Yan, 2009; Huebner & Bynum, 2008) could be tied to these types of contextual factors. Specifically,

neighborhood context and law enforcement attitudes about race, drugs, and crime (Goode, 2002) could be influencing participation rates. Research on drug court outcomes has largely excluded contextual factors and this should be given more consideration in the literature. Other confounding factors, such as criminal history, level of education, and employment, and their links to race, have influenced drug court outcomes (Belenko, 2001; Brewster, 2001; Schiff & Terry, 1997) and these issues should be further explored.

Demographic characteristics play an important role in drug court outcomes despite a lack of agreement among research findings (see Appendix A). Further exploration of these factors could have important policy implications in terms of programming. For instance, Payton and Gossweiler (1999) proposed that a major problem among drug courts is the deficiency of specific, responsive programs in regard to race, gender, and mental illness; MAT could be added to this issue. Drug court programs that set specific selection criteria, detail protocols for adjudication and treatment, and offer specialized means of supervision based on empirical findings in relation to individual level factors could dramatically change what we know about for whom drug courts work for and why.

Independent Variables – Findings and Implications

In addition to an examination of demographic variables in this study, the prediction of drug court graduation among medication-assisted treatment clients was examined by means of trauma experiences, mental health symptoms, and access to prosocial support systems; the only effect found was that of social support. The literature on psychosocial factors as being predictive of drug court outcomes is scarce despite an expansive body of literature that documents significant associations between trauma and mental health factors and substance abuse (Hawkins, Catalano, Miller, 1992; Hasin, Goodwin, & Stinson, 2005; Jacobsen, Southwick, & Kosten, 2001; Triffelman, 2003) and information that indicates high rates of mental health issues among on drug court participants (Cooper, 1997; Dannerbeck, Sundet, & Lloyd, 2002; Hagedorn & Willenbring, 2003). Additionally, the extant

literature demonstrates associations between improved treatment outcomes and social support (McLellan, Arndt, Metzger, Woody, & O'Brien, 1993). Information on MAT drug court participants is even less examined in the drug court literature, especially in regard to psychosocial factors as predictors of graduation. There is, however, some research that examines psychosocial factors in relation to NMPDU, and results indicated that NMPDU was associated with social phobias, depression, and anxiety (Becker, Sullivan, Tetrault, Desai, & Fiellin, 2008). Studies also found gendered effects for NMPDU, with women more likely to exhibit mental health symptoms than men (Brady, Back & Greenfield, 2009).

The aim of the second and third research questions for this study was to examine these particular psychosocial factors to determine their impact on drug court graduation. The guiding hypotheses were that experiences of traumatic stress and mental health symptom severity would have a negative effect on drug court graduation. However, statistical analyses found no significant relationship between trauma experiences or mental health symptoms of medication-assisted drug court treatment clients and drug court graduation. These results are inconsistent with prior research in this area, which indicates that these factors may impact treatment outcomes for both MAT and psychosocial protocols (George & Krystal, 2000). The lack of an effect of these psychosocial factors on drug court graduation could be due to the limitation of using only baseline assessment data, meaning that changes could occur over time that influence graduation. Another explanation is that the measures used in the study, particularly the TSS, are presented in a way that makes the import of the questions easy to determine, which increases the possibility of participants providing social acceptable or biased responses.

The lack of a trauma effect or a mental health effect could also be a function of the treatment program incorporating mental health services within addiction treatment to improve client outcomes. Lastly, there are more sophisticated measures of trauma available, and future research should examine more comprehensive measures for review. Additional investigation should employ different measures

to substantiate or refute this study's findings. There are several explanations as to why a different trauma measure may account for the lack of significant results. First, the TSS measures symptoms related to past traumatic experiences within the last month, whereas participants at the baseline assessment may have been focused on their current criminal justice situation and/or current mental health issues and felt those factors to be a greater burden at the time than the way trauma had affected them in the past. Secondly, it could be that assessing trauma and mental health symptoms in relation to drug court graduation is a more complex issue than a simple model measuring only current symptoms can account for. A more sophisticated longitudinal model using more sensitive measures, such as a more comprehensive measure of trauma and/or qualitative methods, and a consideration of other factors such as therapeutic alliance (collaborative aspect of the counselor/client relationship) (Bordin, 1979) in conjunction with these issues could better account for the nuances inherent in these types of interpersonal problems. The literature strongly suggests that treatment outcomes are negatively influenced by traumatic experiences and mental health symptom severity; even though the findings of this study do not support the association between traumatic experiences and mental health issues, more studies should examine these issues within a drug court context and in connection with the drug-crime relationship to expand our knowledge in these areas and to incorporate an interdisciplinary approach that integrates criminological research within a behavioral healthcare perspective. For example, criminologists are beginning to investigate ways to interpret psychosocial factors in relation to nonmedical use of prescription drugs within existing criminological theories, such as general strain theory (Ford & Schroeder, 2008). An examination of psychosocial factors that are specific to MAT and NMPDU is imperative as the results of a single study cannot determine the scope of this issue. More research is needed to better account for drug court applications that incorporate growing trends of illicit drug use and its treatment.

Criminology can contribute to this body of literature by incorporating factors related to substance abuse within existing theoretical frameworks in the same vein as Ford & Schroder (2008). General Strain Theory (GST) (Agnew, 1992, 1995, 2002, 2006) appears to offer a constructive theoretical framework for explaining the factors associated with individual experiences of strain and substance abuse. The experience of strain (stressors or trauma) as discussed in GST can be thought of as a distal cause of crime; it is through the processes of mediation and conditioning that deviant or criminal behaviors ultimately occur (Piquero and Sealock, 2004). Negative affect is presented as mediating the relationship between strain and crime, while other variables condition strain's effect on crime. The emotion of anger is principally related to criminal acts and emotions related to depressive and trauma related disorders for instance, despair and hopelessness, are related to deviant coping mechanisms such as the use of drugs and/or alcohol (Agnew, 1992, 2001, 2006). GST allows for the examination of the stressors that may contribute to substance abuse and subsequent criminal behaviors surrounding substance abuse. Further exploration of integrating criminological theory with behavior healthcare issues could lead to a better understanding of the impact of mental health on the drug-crime relationship.

The final research question in this study examined the relationship between access to prosocial support systems and drug court graduation. Results indicated a significant association with higher levels of access to prosocial support predicting graduation. Overall social support, emotional support, affectionate support, and positive social interaction were significantly related to drug court graduation, whereas tangible support had no impact on drug court graduation. These findings are consistent with the literature that demonstrates improved treatment outcomes for individuals with support systems available compared with those individuals who do not have these resources (Davis & Jason, 2005; El-Bassel, Chen, & Cooper, 1998; Gearon, Nidecker, Bellack, & Bennett, 2003). Research on social support and drug court outcomes are limited and this finding contributes to the literature in this area. Behavioral

healthcare research establishes a link between perceived social support and improvement in psychosocial functioning during treatment (Chong & Lopez, 2005; Laudet, Cleland, Magura, Vogel, & Knight, 2004; Warren, Stein, & Grella, 2007); this information is useful in adopting treatment strategies and drug court programming to improve client success. Additional research on social support and drug court outcomes should investigate the relationships among perceived social support, therapeutic alliance, mental health symptoms, and traumatic stress experiences to determine if there are interactions between these variables.

Social support networks are featured in several criminological theories that propose a link between these associations and crime (Agnew, 1992; Akers, 1998; Capowich, Mazzerolle, & Piquero, 2001; Cullen & Wright, 1997; Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1994; Warr, 2002), but few studies directly discuss the concept of social support as a criminogenic factor. For example, general strain theory (Agnew, 1992, 2000, 2002, 2006) implies that social support could prevent crime by mediating the effects of negative affect that causes criminal behavior. In Sampson and Laub's (1993) life-course theory of crime, social bonds are discussed as providing "divergent pathways" from crime (p.141). Conversely, differential association theory (Sutherland, 1947 see for e.g. Williams & McShane, 2004) and social learning theory (Akers, 2009) argue that criminal behavior is learned via social interactions.

Exploring social networks within the current trends of the drug-crime relationship could have important implications for drug-crime interventions. Future research should examine the effects of social support on long-term recidivism and relapse as this determination could be important in providing a better understanding of the drug-crime relationship. In fact, Francis Cullen proposed examining social support as an organizing concept within criminological theory in his presidential address to the Academy of Criminal Justice Sciences in 1994 (Cullen, 1994). Cullen states "... in criminology the insights linking social support to crime remain disparate, and are not systematized so far as to direct theoretical and

empirical investigation” (p. 529). Unfortunately, almost 20 years later this remains the case. Perhaps a governing research direction, such as social support within the drug-crime relationship and its subsequent outcomes can inspire the field to adopt Cullen’s proposed steps to include the study of social support within criminology.

Limitations

This study has a number of limitations. The data were collected as part of an evaluation of a single drug court program; there was no comparison group against which the data could be weighed. Therefore, any conclusions generated by the outcomes of this study may apply only to this specific population with negligible generalizability to drug courts overall. However, there are very few drug courts utilizing medication-assisted treatment (MAT) and subsequently not much extant literature examining this population. A conventional drug treatment court or use of a mental health court as a comparison group would not have been feasible since these other types of courts would lack the MAT component.

Another issue with generalizability is the relatively small sample size. Participants in this type of drug court are rare, given the eligibility requirements. Further attrition from the sample caused by declining to participate in the study or by active ongoing participation in drug court treatment did not adversely affect the study, however. Analysis showed that the excluded sample (N=55) did not significantly differ in demographic characteristics from the included sample.

Another limitation was the use of only baseline measures to predict later drug court outcomes. Measurement of the independent variables at a single point in time cannot elucidate how drug court processes and treatment over time could affect outcomes. Additionally, the use of secondary data analysis can be problematic due to data quality issues (Law, 2005). For example, one shortcoming of self-report data is that some participants may not have disclosed instances of trauma and mental health symptoms, limiting the validity and accuracy of the data.

Finally, there were limitations in the statistical analysis regarding the treatment of non-normally distributed variables. Even though there are no assumptions about the distribution of independent variables in logistic regression given that the focus is on the outcome variable (Agresti, 1996; Press & Wilson, 1978), statistical procedures could be applied that further address the skewed distribution of the data for trauma and mental health symptoms; trauma, in particular, had many zero values. Statistical techniques to transform the data, for instance the Box-Cox (1964) transformation, might have helped the data to obtain a more normal distribution using a mathematical method to check for the smallest standard deviation. In this statistical technique, all data are transformed to a certain exponent indicated by a Lambda value (Kim & Hill, 1993; Spitzer, 1982) and non-normally distributed data are transformed to approximate normal distribution (Riani & Atkinson, 2000). This technique does not always work and requires all items under comparison be transformed in the same way (Lindsey & Sheather, 2010; Velilla, 1993). Given the small sample size and issues with the manner in which trauma was measured, power transformation techniques were not applied. However, if further analyses are completed with this data, these techniques should be considered.

Conclusion and Recommendations for Future Research

In conclusion, this study examined demographic characteristics and psychosocial attributes of participants who participated in medication-assisted drug court treatment. The lack of significant findings for trauma and mental health effects may possibly be a function of not controlling for other significant variables; moreover, these data may not have sufficient measures of psychosocial factors, particularly trauma, that demonstrates the relationship. Future studies on these issues would likely benefit from more comprehensive measures and more sophisticated analyses. The significant models found that higher levels of education and greater access to prosocial support were significant predictors of graduation. Future research should continue to investigate these variables to better inform the literature on the practical implications of these findings. The graduation rate for the selected MADCT

sample was 76%, considerably higher than the national average of 51% (Huddleston and Marlowe, 2011) indicating a positive outcome for drug court clients in medication-assisted treatment, an important implication given the current trend of illicit drug use. This research validates that opioid-addicted individuals can achieve treatment success. Implications for this particular court are examining policies to retain participants with less than a high school education, such as improving literacy, and retaining participants with less access to prosocial support systems, such as providing more social support mechanisms within treatment options to further improve outcomes.

Drug court structure, approaches to treatment, and outcomes tend to vary widely, conditions that have caused concern among many researchers as to the generalizability of any drug court findings (Belenko, 2001; Nolan, 2001). However, generalizability may not be achievable and studies that determine whether certain factors (individual or contextual) impact outcomes still contribute to the literature in that common procedures that are then differently applied could be implemented based on a larger body of research. For example, the inclusion of a risk assessment measure or measures of mental health and trauma being consistently applied in drug courts overall would then influence site specific programming that could improve outcomes for individual drug courts that would in turn inform the aggregate research. Future research should consider a more comprehensive examination of not only individual level factors, but also contextual level factors outside of drug court processes that could influence outcomes.

References

- Abbott, A. A. (2003). Meeting the challenges of substance misuse: Making inroads one step at a time. *Health & Social Work, 28*(2), 83–88.
- Abram, K. M., Teplin, L. A., McClelland, G. M., & Dulcan, M. K. (2003). Comorbid psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry, 60*(11), 1097.
- Acierno, R., Resnick, H. S., Flood, A., & Holmes, M. (2003). An acute post-rape intervention to prevent substance use and abuse. *Addictive Behaviors, 28*(9), 1701-1715.
- Agerwala, S. M., & McCance-Katz, E. F. (2012). Integrating screening, brief Intervention, and referral to treatment (SBIRT) into clinical practice settings: a brief review. *Journal of Psychoactive Drugs, 44*(4), 307-317.
- Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology, 30*(1), 47-87.
- Agnew, R. (1995). The contribution of social-psychological strain theory to the explanation of crime and delinquency. In F. Adler & W.S. Laufer (Series Eds.), *The legacy of anomie theory: Vol. 6. Advances in Criminological Theory* (pp. 113-137). New Brunswick, NJ: Transaction.
- Agnew, R. (2002). Experienced, vicarious, and anticipated strain: An exploratory study on physical victimization and delinquency. *Justice Quarterly, 19*, 603-632.
- Agnew, R. (2006). General strain theory: Current status and directions for further research. In F. T. Cullen, J. P. Wright, K. R. Blevins, F. T. Cullen, J. P. Wright & K. R. Blevins (Eds.), *Taking stock: The status of criminological theory*. (pp. 101-123). New Brunswick, NJ US: Transaction Publishers.
- Agresti, A. (1996). *An introduction to categorical data analysis* (Vol. 135). New York: Wiley.
- Akers, R. L. (2009). *Social learning and social structure: A general theory of crime and deviance*. Transaction Books.
- Allen, J. G., Coyne, L., & Huntoon, J. (1998). Complex posttraumatic stress disorder in women from a psychometric perspective. *Journal of Personality Assessment, 70*(2), 277-298.
- Amaro, H., Chernoff, M., Brown, V., Arévalo, S., & Gatz, M. (2007). Does integrated trauma-informed substance abuse treatment increase treatment retention? *Journal of Community Psychology, 35*(7), 845-862.

- Andrews, D. A. & Bonta, J. (2010). *The Psychology of Criminal Conduct*. New Providence, NJ. Matthew Bender & Company, Inc.
- Anglin, M. D., Longshore, D., & Turner, S. (1999). Treatment Alternatives to Street Crime An Evaluation of Five Programs. *Criminal Justice and Behavior*, 26(2), 168-195.
- Arabia, P. L., Fox, G., Caughie, J., Marlowe, D. B., & Festinger, D. S. (2008). Sanctioning practices in an adult felony drug court. *Drug Court Review*, 6, 1-6.
- Apa-Hall, P., Schwartz-Bloom, R. D., & McConnell, E. S. (2008). The current state of teenage drug abuse: trend toward prescription drugs. *Journal of School Nursing*, 24(3), S1.
- Asberg, K., & Renk, K. (2012). Substance use coping as a mediator of the relationship between trauma symptoms and substance use consequences among incarcerated females with childhood sexual abuse histories. *Substance Use & Misuse*, 47(7), 799-808.
- Banks, D., & Gottfredson, D. C. (2003). The effects of drug treatment and supervision on time to rearrest among drug treatment court participants. *Journal of Drug Issues*, 33(2), 385-412.
- Banks, D., & Gottfredson, D. C. (2004). Participation in drug treatment court and time to rearrest. *Justice Quarterly*, 21(3), 637-658.
- Baillargeon, J., Penn, J. V., Knight, K., Harzke, A. J., Baillargeon, G., & Becker, E. A. (2010). Risk of reincarceration among prisoners with co-occurring severe mental illness and substance use disorders. *Administration and Policy in Mental Health and Mental Health Services Research*, 37(4), 367-374.
- Baumer, E. (1994). Poverty, crack, and crime: A cross-city analysis. *Journal of Research in Crime and Delinquency*, 31(3), 311-327.
- Beck, A. J. (2000). *Prisoners in 1999*. Washington, DC: US Department of Justice, Bureau of Justice Statistics.
- Becker, W. C., Fiellin, D. A., & Desai, R. A. (2007). Non-medical use, abuse and dependence on sedatives and tranquilizers among US adults: psychiatric and socio-demographic correlates. *Drug and Alcohol Dependence*, 90(2), 280-287.
- Becker, W. C., Sullivan, L. E., Tetrault, J. M., Desai, R. A., & Fiellin, D. A. (2008). Non-medical use, abuse and dependence on prescription opioids among US adults: psychiatric, medical and substance use correlates. *Drug and Alcohol Dependence*, 94(1), 38-47.
- Beckett, K. Nyrop, K. Pflingst, L. & Bowen, M. (2005). Drug Use, Drug Possession Arrests, and the Question of Race: Lessons from Seattle. *Social Problems* 52(3), 419-441.
- Beckett, K. Sasson. T. (2004). *The politics of injustice: Crime and punishment in America*. Thousand Oaks, CA: Sage.

- Belenko, S. (1998). Research on drug courts: A critical review. *National Drug Court Institute Review*, 1(1), 1-42.
- Belenko, S. (2006). Assessing released inmates for substance-abuse-related service needs. *Crime & Delinquency*, 52(1), 94-113.
- Belenko, S. (2001). Research on drug courts: A critical review 2001 update. *National Drug Court Institute Review*, 4, 1-60.
- Belenko, S. & Dumanovsky, T., New York City Criminal Justice Agency, Inc. (1993). Special drug courts. *Bureau of Justice Assistance Program Brief*. Washington, DC: US Department of Justice.
- Belenko, S., Fagan, J., & Chin, K. L. (1991). Criminal justice responses to crack. *Journal of Research in Crime and Delinquency*, 28(1), 55-74.
- Belenko, S., & Peugh, J. (2005). Estimating drug treatment needs among state prison inmates. *Drug and Alcohol Dependence*, 77(3), 269-281.
- Belknap, J. (2001). *The invisible woman: Gender, crime, and justice* (pp. 227-66). Belmont, CA: Wadsworth.
- Belknap, J. (2007). *The invisible woman: Gender, crime, and justice* (3rd ed.). Belmont, CA: Wadsworth.
- Bennett, T., Holloway, K., & Farrington, D. (2008). The statistical association between drug misuse and crime: A meta-analysis. *Aggression and Violent Behavior*, 13(2), 107-118.
- Bloom, B. E., Owen, B. A., & Covington, S. (2005). *Gender-responsive strategies for women offenders: A summary of research, practice, and guiding principles for women offenders*. US Department of Justice, National Institute of Corrections.
- Blumstein, A. (1993). Racial disproportionality of US prison populations revisited, *University of Colorado Law Review*, 64, 743.
- Blumstein, A., & Cohen, J. (1979). Estimation of individual crime rates from arrest records. *The Journal of Criminal Law and Criminology*, 70(4), 561-585.
- Bordin, E. S. (1979). The generalizability of the psychoanalytic concept of the working alliance. *Psychotherapy: Theory, Research & Practice*, 16(3), 252-260.
- Bouffard, J. A., & Richardson, K. A. (2007). The Effectiveness of Drug Court Programming for Specific Kinds of Offenders Methamphetamine and DWI Offenders Versus Other Drug-Involved Offenders. *Criminal Justice Policy Review*, 18(3), 274-293.
- Box, G. E. P., and D. R. Cox. 1964. An analysis of transformations. *Journal of the Royal Statistical Society*, Series B 26: 211–252.

Bhati, A. S., & Roman, J. K. (2010). Simulated evidence on the prospects of treating more drug-involved offenders. *Journal of Experimental Criminology*, 6(1), 1-33.

Brady, K. T., Back, S. E., & Greenfield, S. F. (Eds.). (2009). *Women and addiction: A comprehensive handbook*. New York: Guilford Press.

Breslau, N., Davis, G. C., & Schultz, L. R. (2003). Posttraumatic stress disorder and the incidence of nicotine, alcohol, and other drug disorders in persons who have experienced trauma. *Archives of General Psychiatry*, 60(3), 289.

Broner, N., Lattimore, P. K., Cowell, A. J., & Schlenger, W. E. (2004). Effects of diversion on adults with co-occurring mental illness and substance use: outcomes from a national multi-site study. *Behavioral Sciences & the Law*, 22(4), 519-541.

Brown, R. (2010). Systematic review of the impact of adult drug-treatment courts. *Translational Research* 155(6), 263-274.

Brown, R. T., Allison, P. A., & Nieto, F. J. (2011). Impact of jail sanctions during drug court participation upon substance abuse treatment completion. *Addiction*, 106(1), 135-142.

Brown, T. A., Campbell, L. A., Lehman, C. L., Grisham, J. R., & Mancill, R. B. (2001). *Current and lifetime comorbidity of the DSM-IV anxiety and mood disorders in a large clinical sample*, *Journal of Abnormal Psychology*, 110(4), 585-599.

Brewster, M. P. (2001). An evaluation of the Chester County (PA) drug court program. *Journal of Drug Issues*, 31(1), 177-206.

Butzin, C. A., Saum, C. A., & Scarpitti, F. R. (2002). Factors associated with completion of a drug treatment court diversion program. *Substance Use & Misuse*, 37(12-13), 1615-1633.

Cai, R., Crane, E., Poneleit, K., & Paulozzi, L. (2010). Emergency department visits involving nonmedical use of selected prescription drugs in the United States, 2004-2008. *Journal of Pain and Palliative Care Pharmacotherapy*, 24(3), 293-297.

Califano, J. A. (2005). Under the counter: The diversion and abuse of controlled prescription drugs in the US. *New York, NY: National Center on Addiction and Substance Abuse, Columbia University*.

Capowich, G. E., Mazerolle, P., & Piquero, A. (2001). General strain theory, situational anger, and social networks: An assessment of conditioning influences. *Journal of Criminal Justice*, 29(5), 445-461.

Carlson, B. E., Shafer, M. S., & Duffee, D. E. (2010). Traumatic histories and stressful life events of incarcerated parents II: Gender and ethnic differences in substance abuse and service needs. *The Prison Journal*, 90(4), 494-515.

Caulkins, J. P., & Sevigny, E. L. (2005). How many people does the US imprison for drug use, and who are they. *Contemporary Drug Problems*, 32, 405.

- Center for Substance Abuse Treatment (CSAT). (2005). Substance abuse treatment for persons with co-occurring disorders. Treatment Improvement Protocol (TIP) Series. S. Sacks (Chair) & R. Reis (Co-Chair), Consensus Panel. DHHS Pub. (SMA). Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Chan, Y. F., Huang, H., Sieu, N., & Unützer, J. (2013). Substance screening and referral for substance abuse treatment in an integrated mental health care program. *Psychiatric Services, 64*(1), 88-90.
- Chesney-Lind, M., Pasco, L. (2004). *The Female Offender: Girls, Women, and Crime*. Thousand Oaks, CA: Sage Publications, Inc.
- Chilcoat, H. D., & Breslau, N. (1998a). Investigations of causal pathways between PTSD and drug use disorders. *Addictive Behaviors, 23*(6), 827-840.
- Chilcoat, H. D., & Breslau, N. (1998b). Posttraumatic stress disorder and drug disorders: testing causal pathways. *Archives of General Psychiatry, 55*(10), 913.
- Chong, J., & Lopez, D. (2005). Social networks, support, and psychosocial functioning among American Indian women in treatment. *American Indian and Alaska Native Mental Health Research, 12*, 62-85.
- Cicero, T. J., Inciardi, J. A., & Muñoz, A. (2005). Trends in abuse of OxyContin® and other opioid analgesics in the United States: 2002-2004. *The Journal of Pain, 6*(10), 662-672.
- Cheesman, F.L., Rubio, D. M., & Van Dutzend, R. (2004). Developing Statewide Performance Measures for Drug Courts. *National Center for State Courts. Statewide Technical Assistance Bulletin, 2*, 1-8.
- Cissner, A. B., & Rempel, M. (2005). *The State of Drug Court Research: Moving Beyond "do They Work?'* New York: Center for Court Innovation.
- Clark, C., & Fearday, F. (2003). Triad women's project: Group facilitator's manual. *University of South Florida*.
- Clear, T. R., & Schrantz, D. (2011). Strategies for reducing prison populations. *The Prison Journal, 91*(3), 138S-159S.
- Coalition Against Insurance Fraud. (2007). *Prescription for peril: how insurance fraud finances theft and abuse of addictive prescription drugs*. Washington, DC: Author.
- Cobb, N. (2006). Patronising the mentally disordered? Social landlords and the control of 'anti-social behaviour' under the Disability Discrimination Act 1995. *Legal Studies, 26*(2), 238-266.
- Conway, K. P., Compton, W., Stinson, F. S., & Grant, B. F. (2006). Lifetime comorbidity of DSM-IV mood and anxiety disorders and specific drug use disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry, 67*(2), 247-257.

- Cosden, M., Basch, J. E., Campos, E., Greenwell, A., Barazani, S., & Walker, S. (2006). Effects of motivation and problem severity on court-based drug treatment. *Crime & Delinquency*, 52(4), 599-618.
- Correctional Association of New York. (2006). Women in Prison Project. <http://wamusa.org/pdf/WIPP-Why-Focus-On-Incarcerated-Women-2006.pdf>.
- Council, C. L. (Ed.). (2004). *Health services utilization by individuals with substance abuse and mental disorders* (DHHS Publication No. SMA 04-3949, Analytic Series A-25). Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies.
- Covington, S. (1998). The relational theory of women's psychological development: Implications for the criminal justice system. In R. T. Zeplin (Ed.), *Female offenders critical perspectives and effective interventions* (pp.113-128). Gaithersburg, MD: Aspen Publishers.
- Cullen, F. T. (1994). Social support as an organizing concept for criminology: Presidential address to the Academy of Criminal Justice Sciences. *Justice Quarterly*, 11(4), 527-559.
- Cullen, F. T. & Wright, J. P. (1997) Liberating the anomie-strain theory paradigm: Implications from social support theory. In Nikos Passas and Robert Agnew (eds.), p. 187-206. *Assessing the Anomie-Strain Tradition*. Boston, MA: Northeastern University Press.
- Dakof, G. A., Cohen, J. B., Henderson, C. E., Duarte, E., Boustani, M., Blackburn, A., Hawes, S. (2010). A randomized pilot study of the engaging moms program for family drug court. *Journal of Substance Abuse Treatment*, 38(3), 263-274.
- Daly, K. (1994). *Gender, crime, and punishment*. Yale University Press.
- Daniel, A. E. (2007). Care of the mentally ill in prisons: challenges and solutions. *Journal of the American Academy of Psychiatry and the Law Online*, 35(4), 406-410.
- Dannerbeck, A., Harris, G., Sundet, P., & Lloyd, K. (2006). Understanding and responding to racial differences in drug court outcomes. *Journal of Ethnicity in Substance Abuse*, 5(2), 1-22.
- Dass-Brailsford, P., & Myrick, A. C. (2010). Psychological trauma and substance abuse: The need for an integrated approach. *Trauma, Violence, & Abuse*, 11(4), 202-213.
- Davis, M. I., & Jason, L. A. (2005). Sex differences in social support and self-efficacy within a recovery community. *American Journal of Community Psychology*, 36(3-4), 259-274.
- Deschenes, E. P., Ireland, C., & Kleinpeter, C. B. (2009). Enhancing drug court success. *Journal of Offender Rehabilitation*, 48(1), 19-36.
- DeMatteo, D., Marlowe, D. B., Festinger, D. S., & Arabia, P. L. (2009). Outcome Trajectories in Drug Court Do All Participants Have Serious Drug Problems?. *Criminal Justice and Behavior*, 36(4), 354-368.

- Dennis, M. L., White, M. K., Titus, J. C., & Unsicker, J. I. (2006). Short Blessed Scale Exam: Global Appraisal of Individual Needs: Trainer's Training Manual and Resources. July 2006 version. *Bloomington, IL: Chestnut Health Systems.*
- Derogatis, L. R., & Spencer, M. S. (1982). The Brief Symptom Inventory (BSI): Administration, scoring, and procedures manual-1. Baltimore: Johns Hopkins University School of Medicine, Clinical Psychometrics Research Unit
- Ditton, P. M. (1999). Special Report Mental Health and Treatment of Inmates and Probationers. *Washington, DC: US Department of Justice, Bureau of Justice Statistics.*
- Dobkin, P. L., Civita, M. D., Paraherakis, A., & Gill, K. (2002). The role of functional social support in treatment retention and outcomes among outpatient adult substance abusers. *Addiction, 97*(3), 347-356.
- Dowden, C., & Andrews, D. A. (1999). What works for female offenders: A meta-analytic review. *Crime & Delinquency, 45*(4), 438-452.
- Dowden, C., & Brown, S. L. (2002). The role of substance abuse factors in predicting recidivism: A meta-analysis. *Psychology, Crime and Law, 8*(3), 243-264.
- Draine, J., & Herman, D. (2007). Critical time intervention for reentry from prison for persons with mental illness. *Psychiatric Services, 58*(12), 1577-1581.
- Drake, R. E., Mueser, K. T., Brunette, M. F., & McHugo, G. J. (2004). A review of treatments for people with severe mental illnesses and co-occurring substance use disorders. *Psychiatric Rehabilitation Journal, 27*(4), 360.
- Drug Enforcement Administration (2001)., Last Acts, Pain and Policy Studies Group, American Academy of Hospice and Palliative Medicine, American Academy of Pain Medicine, American Alliance of Cancer Pain Initiatives. *Promoting pain relief and preventing abuse of pain medications: A critical balancing act.* Washington, DC: Last Acts, 2001. Available at www.medsch.wisc.edu/painpolicy/dea01.htm.
- Durlauf, S. N., & Nagin, D. S. (2011). Imprisonment and crime. *Criminology & Public Policy, 10*(1), 13-54.
- Dynia, P., & Sung, H. E. (2000). The safety and effectiveness of diverting felony drug offenders to residential treatment as measured by recidivism. *Criminal Justice Policy Review, 11*(4), 299-311.
- El-Bassel, N., Chen, D. R., & Cooper, D. (1998). Social support and social network profiles among women on methadone. *Social Service Review, 72*(3), 379-491.
- Evans, E., Li, L., & Hser, Y. I. (2009). Client and program factors associated with dropout from court mandated drug treatment. *Evaluation and Program Planning, 32*(3), 204-212.

- Fallot, R. D., & Harris, M. (2002). The Trauma Recovery and Empowerment Model (TREM): Conceptual and practical issues in a group intervention for women. *Community Mental Health Journal*, 38(6), 475-485.
- Fazel, S., & Danesh, J. (2002). Serious mental disorder in 23,000 prisoners: a systematic review of 62 surveys. *The Lancet*, 359(9306), 545-550.
- Festinger, D. S., Marlowe, D. B., Lee, P. A., Kirby, K. C., Bovasso, G., & McLellan, A. T. (2002). Status hearings in drug court: When more is less and less is more. *Drug and Alcohol Dependence*, 68(2), 151-157.
- Finigan, M. W. (2009). Understanding racial disparities in drug courts. *Drug Court Review*, 6(2), 135-142
- Finn, P., & Newlyn, A. K. (1997). Miami's drug court: A different approach. In L. K. Gaines & P. B. Kraska (Eds.), *Drugs, crime, and justice*(pp. 357-374). Prospect Heights, IL: Waveland.
- Ford, J. D., Courtois, C. A., Steele, K., Hart, O. V. D., & Nijenhuis, E. R. (2005). Treatment of complex posttraumatic self-dysregulation. *Journal of Traumatic Stress*, 18(5), 437-447.
- Ford, J. D., Hawke, J., Alessi, S., Ledgerwood, D., & Petry, N. (2007). Psychological trauma and PTSD symptoms as predictors of substance dependence treatment outcomes. *Behaviour Research and Therapy*, 45(10), 2417-2431.
- Ford, J. A., & Schroeder, R. D. (2008). Academic strain and non-medical use of prescription stimulants among college students. *Deviant Behavior*, 30(1), 26-53.
- Fradella, H. F., Fischer, R. G., Kleinpeter, C. H., & Koob, J. J. (2009). Latino Youth in the Juvenile Drug Court of Orange County, California. *Journal of Ethnicity in Criminal Justice*, 7(4), 271-292.
- Frisher, M., Crome, I., Macleod, J., Millson, D., & Croft, P. (2005). Substance misuse and psychiatric illness: prospective observational study using the general practice research database. *Journal of Epidemiology and Community Health*, 59 (10), 847-850.
- Gallagher, J. R. (2013) Drug Court Graduation Rates: Implications for Policy Advocacy and Future Research, *Alcoholism Treatment Quarterly*, 31:2, 241-253
- Garland, D. (2001). *The culture of control: Crime and social order in contemporary society* (Vol. 77). Oxford: Oxford University Press.
- Garrity, A.G., Pearlson, G.D., McKiernan, K., Lloyd, D., Kiehl, K.A., Calhoun, V.D., 2007. Aberrant "default mode" functional connectivity in schizophrenia. *American Journal of Psychiatry*, 164, 450-457
- Garrity, T.F., Prewitt, S.H., Joosen, M., Staton Tindall, M., Webster, J.M., Hiller, M.L., & Leukefeld, C.G. (2006). Correlates of subjective stress among drug court clients. *International Journal of Offender Therapy and Comparative Criminology*, 50(3), 269-279.

- Gearon, J. S., Nidecker, M., Bellack, A., & Bennett, M. (2003). Gender differences in drug use behavior in people with serious mental illnesses. *The American Journal on Addictions, 12*(3), 229-241.
- Gibbs, L. S., & Haddox, J. D. (2003). Lawful prescribing and the prevention of diversion. *Journal of Pain and Palliative Care Pharmacotherapy, 17*(1), 5-14.
- Gil-Rivas, V., Prause, J., & Grella, C. E. (2009). Substance use after residential treatment among individuals with co-occurring disorders: the role of anxiety/depressive symptoms and trauma exposure. *Psychology of Addictive Behaviors, 23*(2), 303.
- Goldkamp, J. S., White, M. D., & Robinson, J. B. (2001). Do drug courts work? Getting inside the drug court black box. *Journal of Drug Issues, 31*(1), 27-72.
- Goldstein, Paul J. 1985. The drugs/violence nexus: A tripartite conceptual framework. *Journal of Drug Issues 15*:493–506.
- Goode, E. (2002). Drug arrests at the millennium. *Society, 39*(5), 41-45.
- Gottfredson, D. C., & Exum, M. L. (2002). The Baltimore city drug treatment court: One-year results from a randomized study. *Journal of Research in Crime and Delinquency, 39*(3), 337-356.
- Gottfredson, D. C., Kearley, B. W., Najaka, S. S., & Rocha, C. M. (2007). How Drug Treatment Courts Work An Analysis of Mediators. *Journal of Research in Crime and Delinquency, 44*(1), 3-35.
- Gottfredson, D. C., Najaka, S. S., & Kearley, B. (2003). Effectiveness of Drug Treatment Courts: Evidence From A Randomized Trial*. *Criminology & Public Policy, 2*(2), 171-196.
- Government Accountability Office. (2011). Adult Drug Courts - Highlights of GAO-12-53, a report to congressional committees.
- Gray, A., & Saum, C. A. (2005). Mental health, gender, and drug court completion. *American Journal of Criminal Justice, 30*(1), 55-69.
- Green, B. L., Miranda, J., Daroowalla, A., & Siddique, J. (2005). Trauma exposure, mental health functioning, and program needs of women in jail. *Crime & Delinquency, 51*(1), 133-151.
- Hagedorn, H., & Willenbring, M. L. (2003). Psychiatric illness among drug court probationers. *The American Journal of Drug and Alcohol Abuse, 29*(4), 775-788.
- Hansen, R. N., Oster, G., Edelsberg, J., Woody, G. E., & Sullivan, S. D. (2011). Economic costs of nonmedical use of prescription opioids. *The Clinical Journal of Pain, 27*(3), 194-202.
- Hartley, R. E., & Phillips, R. C. (2001). Who graduates from drug courts? Correlates of client success. *American Journal of Criminal Justice, 26*(1), 107-119.

- Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychological Bulletin*, *112*(1), 64.
- Harwood, H. J., Hubbard, R. L., Collins, J. J., & Rachal, J. V. (1988). The costs of crime and the benefits of drug abuse treatment: A cost-benefit analysis using TOPS data. *NIDA Research Monograph*, *86*, 209-235.
- Hasin, D. S., Goodwin, R. D., Stinson, F. S., & Grant, B. F. (2005). Epidemiology of major depressive disorder: results from the National Epidemiologic Survey on Alcoholism and Related Conditions. *Archives of General Psychiatry*, *62*(10), 1097.
- Havassy, B. E., Hall, S. M., & Wasserman, D. A. (1991). Social support and relapse: Commonalities among alcoholics, opiate users, and cigarette smokers. *Addictive Behaviors*, *16*(5), 235-246.
- Hearn, W. L., Rose, S., Wagner, J., Ciarleglio, A., & Mash, D. C. (1991). Cocaethylene is more potent than cocaine in mediating lethality. *Pharmacology Biochemistry and Behavior*, *39*(2), 531-533.
- Heimer, Karen. 2000. Changes in the gender gap in crime and women's economic marginalization. In *The Nature of Crime: Continuity and Change; Criminal Justice 2000*, vol. 1, ed. Gary LaFree. Washington, DC: National Institute of Justice.
- Hein, D.A., Nunes, E., Levin, F.R., & Fraser, D. (2000) Posttraumatic stress disorder and short-term outcome in early methadone treatment. *Journal of Substance Abuse Treatment*, *19*, 31-7.
- Hein, D., Zimberg, S., Weisman, S., First, M. & Ackerman, S. (1997). Dual diagnosis subtypes in urban substance abuse and mental health clinics. *Journal of Psychiatric Services*, *48*, 1058-1063.
- Henwood, B., & Padgett, D. K. (2007). Reevaluating the Self-Medication Hypothesis among the Dually Diagnosed. *The American Journal on Addictions*, *16*(3), 160-165.
- Hepburn, J. R., & Harvey, A. N. (2007). The effect of the threat of legal sanction on program retention and completion: Is that why they stay in drug court?. *Crime & Delinquency*, *53*(2), 255-280.
- Herman-Stahl, M. A., Krebs, C. P., Kroutil, L. A., & Heller, D. C. (2007). Risk and protective factors for methamphetamine use and nonmedical use of prescription stimulants among young adults aged 18 to 25. *Addictive Behaviors*, *32*(5), 1003-1015.
- Hernandez, S. H., & Nelson, L. S. (2010). Prescription drug abuse: insight into the epidemic. *Clinical Pharmacology & Therapeutics*, *88*(3), 307-317.
- Hickert, A.O., Boyle, S.W., Tollefson, D.R., (2009). Factors that predict drug court completion and dropout: Findings from an evaluation of Salt Lake County's adult felony drug court. *Journal of Social Service Research*, *35*, 149-162.
- Hiller, M. L., Knight, K., & Simpson, D. D. (1999). Risk factors that predict dropout from corrections-based treatment for drug abuse. *The Prison Journal*, *79*(4), 411-430.

- Hirschi, T., & Gottfredson, M. (1983). Age and the explanation of crime. *American Journal of Sociology*, 552-584.
- Hoffman, M. B. (1999). Drug Court Scandal, *The NCL Review*, 78, 1437.
- Hosmer Jr, D. W., & Lemeshow, S. (2010). *Applied logistic regression*. John Wiley & Sons; New York.
- Huang, B., Dawson, D. A., Stinson, F. S., Hasin, D. S., Ruan, W., Saha, T. D., ... & Grant, B. F. (2006). Prevalence, correlates, and comorbidity of nonmedical prescription drug use and drug use disorders in the United States: Results of the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, 67(7), 1062-1073.
- Hubbard, D. J., & Matthews, B. (2008). Reconciling the differences between the “gender-responsive” and the “what works” literatures to improve services for girls. *Crime & Delinquency*, 54(2), 225-258.
- Huddleston, C. W., & Marlowe, D. B. (2011). *Painting the current picture: A national report on drug courts and other problem-solving court programs in the United States*. Washington, DC: National Drug Court Institute.
- Huddleston, C. West, Douglas Marlowe, and Rachel Casebolt. 2008. *Painting the current picture: A National Report Card on Drug Courts and other problem-solving court programs in the United States*. Washington, DC: Bureau of Justice Assistance, Office of Justice Programs, US Department of Justice.
- Huebner, B. M., & Bynum, T. S. (2008). The role of race and ethnicity in parole decisions*. *Criminology*, 46(4), 907-938.
- Hyer, L., Davis, H., Boudewyns, P., & Woods, M. G. (1991). A short form of the Mississippi scale for Combat-Related PTSD. *Journal of Clinical Psychology*, 47(4), 510-518.
- Incardi, J. A., McBride, D. C., & McCoy, H. V. (1997). Recent research on the crack/cocaine/crime connection. *Drug Use and Drug Policy*, 2, 133.
- Jacobsen, L.K., Southwick, S.M., Kosten, T. R. (2001). Substance Use Disorders in Patients with Posttraumatic Stress Disorder: A Review of the Literature. *American Journal of Psychiatry* 158, 1184–1190
- James, D. J., & Glaze, L. E. (2006). *Mental health problems of prison and jail inmates*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics.
- Johnson, J. G., Cohen, P., Brown, J., Smailes, E. M., & Bernstein, D. P. (1999). Childhood maltreatment increases risk for personality disorders during early adulthood. *Archives of General Psychiatry*, 56(7), 600.

- Johnson, R. J., Ross, M. W., Taylor, W. C., Williams, M. L., Carvajal, R. I., & Peters, R. J. (2006). Prevalence of childhood sexual abuse among incarcerated males in county jail. *Child Abuse & Neglect, 30*(1), 75-86.
- Johnston, L.D., O'Malley, P.M., Bachman, J. G., & Schulenberg, J. E. (2012). *Monitoring the future national results on adolescent drug use: overview of key findings, 2011*. Ann Arbor (MI): Institute for Social Research, The University of Michigan.
- Keane, T. M., Caddell, J. M., & Taylor, K. L. (1988). Mississippi Scale for Combat-Related Posttraumatic Stress Disorder: Three studies in reliability and validity. *Journal of Consulting and Clinical Psychology, 56*(1), 85.
- Kessler, R. C., Berglund, P., Borges, G., Nock, M., & Wang, P. S. (2005). Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990-1992 to 2001-2003. *JAMA: The Journal of the American Medical Association, 293*(20), 2487-2495.
- Khantzian, E. J., & Treece, C. (1985). DSM-III psychiatric diagnosis of narcotic addicts: Recent findings. *Archives of General Psychiatry, 42*(11), 1067.
- Khoury, L., Tang, Y. L., Bradley, B., Cubells, J. F., & Ressler, K. J. (2010). Substance use, childhood traumatic experience, and posttraumatic stress disorder in an urban civilian population. *Depression and Anxiety, 27*(12), 1077-1086.
- Kim, M., & Hill, R. C. (1993). The Box-Cox transformation-of-variables in regression. *Empirical Economics, 18*(2), 307-319.
- King, R. S. The Sentencing Project (2008) *Disparity by geography The War on Drugs in America's cities*. project report. <http://www.opensocietyfoundations.org/reports/disparity-geography>
- King, R., & Pasquarella, J. (2009). Drug courts a review of the evidence. http://www.sentencingproject.org/doc/dp_drugcourts.pdf
- King, D. W., King, L. A., Fairbank, J. A., Schlenger, W. E., & Surface, C. R. (1993). Enhancing the precision of the Mississippi Scale for Combat-Related Posttraumatic Stress Disorder: An application of item response theory. *Psychological Assessment, 5*(4), 457.
- Kingston, S., & Raghavan, C. (2009). The relationship of sexual abuse, early initiation of substance use, and adolescent trauma to PTSD. *Journal of Traumatic Stress, 22*(1), 65-68.
- Krohn, M. D., Lizotte, A. J., Thomberry, T. P., Smith, C., & McDowall, D. (1996). Reciprocal causal relationships among drug use, peers, and beliefs: A five-wave panel model. *Journal of Drug Issues, 26*, 405-429.
- Lamb, H. R., & Weinberger, L. E. (2005). The shift of psychiatric inpatient care from hospitals to jails and prisons. *Journal of the American Academy of Psychiatry and the Law Online, 33*(4), 529-534.

- Langan, P. A., & Levin, D. J. (2002). Recidivism of prisoners released in 1994. *Federal Sentencing Reporter*, 15(1), 58-65.
- Laudet, A. B., Magura, S., Vogel, H. S., & Knight, E. L. (2004). Perceived reasons for substance misuse among persons with a psychiatric disorder. *American Journal of Orthopsychiatry*, 74(3), 365-375.
- Lauritsen, J. L., Heimer, K., & Lynch, J. P. (2009). Trends in the gender gap in violent offending: new evidence from the national crime victimization survey*. *Criminology*, 47(2), 361-399.
- Lauterbach, D., Vrana, S., King, D. W., & King, L. A. (1997). Psychometric properties of the civilian version of the Mississippi PTSD Scale. *Journal of Traumatic Stress*, 10(3), 499-513.
- Law, M. (2005). „Reduce, Reuse, Recycle: Issues in the Secondary Use of Research Data. *IASSIST Quarterly*, 29(1), 5-10.
- Lesperance, T., Moore, K. A., Barrett, B., Young, M. S., Clark, C., & Ochshorn, E. (2011). Relationship between trauma and risky behavior in substance-abusing parents involved in a Family Dependency Treatment Court. *Journal of Aggression, Maltreatment & Trauma*, 20(2), 163-174.
- Leverentz, A. M. (2006). The love of a good man? Romantic relationships as a source of support or hindrance for female ex-offenders. *Journal of Research in Crime and Delinquency*, 43(4), 459-488.
- Levinthal, C. F. (2008). *Drugs, society, and criminal justice*. Pearson/Allyn and Bacon.
- Lindsey, C., & Sheather, S. J. (2010). Optimal power transformation via inverse response plots. *Stata Journal*, 10(2), 200-214.
- Lo, S. K., Li, I. T., Tsou, T. S., & See, L. (1995). Non-significant in univariate but significant in multivariate analysis: a discussion with examples. *Changgeng yi xue za zhi/Changgeng ji nian yi yuan= Chang Gung medical journal/Chang Gung Memorial Hospital*, 18(2), 95-101.
- Loeber, R., Farrington, D., Stouthamer-Loeber, M., Moffitt, T. E., & Caspi, A. (1998). The development of male offending: Key findings from the first decade of the Pittsburgh Youth Study. *Studies on Crime and Crime Prevention*, 7, 141-172.
- Logan, T. K., Williams, K., Leukefeld, C., & Minton, L. (2000). A drug court process evaluation: Methodology and findings. *International Journal of Offender Therapy and Comparative Criminology*, 369-394.
- Lowenkamp, C., Holsinger, A. M., & Latessa, E. J. (2005). Are drug courts effective: A meta-analytic review. *Journal of Community Corrections*, 28, 5-10.
- Lutze, F. E., & van Wormer, J. G. (2007). Criminal Justice Policy. *Policy Review*, 18(3), 226-245.
- MacCoun, R., Kilmer, B., & Reuter, P. (2003). Research on drugs-crime linkages: The next generation. *Toward a drugs and crime research agenda for the 21st century*, 65-95.

- MacKenzie, D. L., & Uchida, C. D. (Eds.). (1994). *Drugs and crime: Evaluating public policy initiatives*. Thousand Oaks, CA: Sage.
- Maguire, L. (1991) *Social Support Systems in Practice: A Generalist Approach*. Washington, D.C.: National Association of Social Workers (NASW) Press.
- Maremmani, I., Pacini, M., & Lovrecic, M. (2004). Clinical foundations for the use of methadone in jail. *Heroin Addiction and Related Clinical Problems*, 6, 53-72.
- Marlowe, D. B. (2010). Research update on adult drug courts. <http://www1.spa.american.edu/justice/documents/3067.pdf>
- Marlowe, D. B., Festinger, D. S., Lee, P. A., Dugosh, K. L., & Benasutti, K. M. (2006). Matching judicial supervision to clients' risk status in drug court. *Crime & Delinquency*, 52(1), 52-76.
- Martin, S. S., Butzin, C. A., Saum, C. A., & Inciardi, J. A. (1999). Three-year outcomes of therapeutic community treatment for drug-involved offenders in Delaware: From prison to work release to aftercare. *The Prison Journal*, 79(3), 294-320.
- Martinson, R. (1974). "What Works? - Questions and Answers About Prison Reform," *The Public Interest*, pp. 22-54.
- Mauer, M. (2003). *Comparative International Rates of Incarceration: An Examination of Causes and Trends Presented to the US Commission on Civil Rights*. Washington, DC: The Sentencing Project.
- Mauer, M., & King, R. S. (2007a). *Uneven justice: State rates of incarceration by race and ethnicity* (pp. 1-23). Washington, DC: The Sentencing Project.
- Mauer, M., & King, R. S. (2007b). *A 25-year quagmire: The war on drugs and its impact on American society*. Washington, DC: The Sentencing Project.
- McCabe, S. E., Cranford, J. A., Morales, M., & Young, A. (2006). Simultaneous and concurrent polydrug use of alcohol and prescription drugs: prevalence, correlates, and consequences. *Journal of Studies on Alcohol*, 67(4), 529.
- McCabe, S. E., Teter, C. J., Boyd, C. J., Knight, J. R., & Wechsler, H. (2005). Nonmedical use of prescription opioids among US college students: Prevalence and correlates from a national survey. *Addictive Behaviors*, 30(4), 789-805.
- McCauley, J., Ruggiero, K. J., Resnick, H. S., Conoscenti, L. M., & Kilpatrick, D. G. (2009). Forcible, drug-facilitated, and incapacitated rape in relation to substance use problems: Results from a national sample of college women. *Addictive Behaviors*, 34(5), 458-462.
- McLellan, A. T., Arndt, I. O., Metzger, D. S., Woody, G. E., & O'Brien, C. P. (1993). The effects of psychosocial services in substance abuse treatment. *Journal of Addictions Nursing*, 5(2), 38-47.

- Merrall, E. L., & Bird, S. M. (2009). A statistical perspective on the design of drug-court studies. *Evaluation Review, 33*(3), 257-280.
- Menard, S. (1995). *Applied logistic regression analysis: Sage university series on quantitative applications in the social sciences*. Thousand Oaks, CA: Sage.
- Menard, S. (2011). Standards for standardized logistic regression coefficients. *Social Forces, 89*(4), 1409-1428.
- Mendoza, N. S., Trinidad, J. R., Nochajski, T. H., & Farrell, M. C. (2013). Symptoms of depression and successful drug court completion. *Community Mental Health Journal, 49*, 787-792.
- Messina, N., Grella, C. E., Cartier, J., & Torres, S. (2010). A randomized experimental study of gender-responsive substance abuse treatment for women in prison. *Journal of Substance Abuse Treatment, 38*(2), 97-107.
- Miethe, T. D., Lu, H., & Reese, E. (2000). Reintegrative shaming and recidivism risks in drug court: Explanations for some unexpected findings. *Crime & Delinquency, 46*(4), 522-541.
- Miller, M. (2004). Sentencing Reform Reform: The Sentencing Information System Alternative to Sentencing Guidelines.
- Miller, D., & Guidry, L. (2001). *Addictions and trauma recovery: Healing the body, mind and spirit*. New York: WW Norton & Co.
- Miller, N. A., & Najavits, L. M. (2012). Creating trauma-informed correctional care: a balance of goals and environment. *European Journal of Psychotraumatology, 3*.
- Miller, J. M., & Shutt, J. E. (2001). Considering the need for empirically grounded drug court screening mechanisms. *Journal of Drug Issues, 31*(1), 91-106.
- Minkoff, K. (2008). Dual diagnosis enhanced programs. *Journal of Dual Diagnosis, 4*(3), 320-325.
- Mitchell, O., Wilson, D. B., Eggers, A., & MacKenzie, D. L. (2012). Assessing the effectiveness of drug courts on recidivism: A meta-analytic review of traditional and non-traditional drug courts. *Journal of Criminal Justice, 40*, 60-71.
- Modisette, K. C., Hunter, B. D., Ives, M. L., Funk, R. R., & Dennis, M. L. (2009). *NORMS including alpha, mean, N, sd, ICC for adolescents (by demographics) and overall for young adults (18-25) and adults (18+) using the CLAT 2008 V5 Dataset*. Chestnut Health Systems.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: a developmental taxonomy. *Psychological Review, 100* (4), 674.
- Moffitt, T. E. (1994). Natural histories of delinquency. In *Cross-national longitudinal research on human development and criminal behavior*(pp. 3-61). Springer Netherlands.

- Moffitt, T. E., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. *Development and Psychopathology*, 13(2), 355-375.
- Morash, M. (2006). *Understanding gender, crime, and justice*. Thousand Oaks, CA: Sage Publications.
- Mosher, C. (2001). Predicting drug arrest rates: Conflict and social disorganization perspectives. *Crime & Delinquency*, 47(1), 84-104.
- Mueser, K. T., Drake, R. E., & Wallach, M. A. (1998). Dual diagnosis: a review of etiological theories. *Addictive Behaviors*, 23(6), 717-734.
- Mundry, R., & Nunn, C. L. (2009). Stepwise model fitting and statistical inference: turning noise into signal pollution. *The American Naturalist*, 173(1), 119-123.
- Najavits, L. M. (2006). Present-versus past-focused therapy for posttraumatic stress disorder/substance abuse: A study of clinician preferences. *Brief Treatment and Crisis Intervention*, 6 (3), 248.
- National Association of Drug Court Professionals. (2011). Drug court history. <http://www.nadcp.org/learn/what-are-drug-courts/history>
- National Drug Control Strategy. (2011) Office of National Drug Control Policy.
- National Drug Intelligence Center, U.S. Department of Justice. *National Drug Threat Assessment*, 2011. Product No . 2011-Q0317-001
- National Institutes of Health, National Institute on Drug Abuse, & United States of America. (2007). *Drugs, Brains, and Behavior: The Science of Addiction*.
- National Institute of Justice. (2006). *Drug Courts: The Second Decade*. U.S. Department of Justice, Office of Justice Programs.
- Najavits, L. M. (2002). *Seeking Safety: A treatment manual for PTSD and substance abuse*. New York: Guilford Press.
- Najavits, L. M. (2004). Assessment of trauma, PTSD, and substance use disorder. In John P. Wilson & Terence M. Keane (Eds.) *Assessing psychological trauma and PTSD*, 466-491.
- Najavits, L. M., Weiss, R. D., & Shaw, S. R. (1999). A clinical profile of women with posttraumatic stress disorder and substance dependence. *Psychology of Addictive Behaviors*, 13(2), 98.
- Nester, E.J. & Malenka, R. C (2004). The Addicted Brain. *Scientific American*, 78-85.
- Nocon, A., Berge, D., Astals, M., Martin-Santos, R., & Torrens, M. (2007). Dual diagnosis in an inpatient drug-abuse detoxification unit. *European Addiction Research*, 13(4), 192-200.

- Nolan Jr, J. L. (2010). Harm Reduction and the American Difference: Drug Treatment and Problem-Solving Courts in Comparative Perspective. *Journal of Health Care Law & Policy*, 13, 31.
- O'Brien, C. P. (2005). Anticraving medications for relapse prevention: a possible new class of psychoactive medications. *American Journal of Psychiatry*, 162(8), 1423-1431.
- Quimette, P. C., Finney, J. W., & Moos, R. H. (1999). Two-year posttreatment functioning and coping of substance abuse patients with posttraumatic stress disorder. *Psychology of Addictive Behaviors*, 13(2), 105.
- Quimette, P. C., Brown, P. J., & Najavits, L. M. (1998). Course and treatment of patients with both substance use and posttraumatic stress disorders. *Addictive Behaviors*, 23(6), 785-795.
- Palmer, E. J., & Hollin, C. R. (2007). The Level of Service Inventory-Revised with English women prisoners: A needs and reconviction analysis. *Criminal Justice and Behavior*, 34(8), 971-984.
- Paulozzi, L. J., Weisler, R. H., & Patkar, A. A. (2011). A national epidemic of unintentional prescription opioid overdose deaths: how physicians can help control it. *Journal of Clinical Psychiatry*, 72(5), 589.
- Peters, R. H., Haas, A. L., & Murrin, M. R. (1999). Predictors of retention and arrest in drug courts. *National Drug Court Institute Review*, 2(1), 33-60.
- Petersen, C. L., & Zettle, R. D. (2010). Treating inpatients with comorbid depression and alcohol use disorders: A comparison of acceptance and commitment therapy versus treatment as usual. *The Psychological Record*, 59(4), 2.
- Peyton, E. A., & Gossweiler, R. (2001). Treatment services in adult drug courts: Report on the 1999 National Drug Court Treatment Survey [executive summary]. *Washington, DC: US Department of Justice*.
- Picken, A., & Tarrier, N. (2011). Trauma and comorbid posttraumatic stress disorder in individuals with schizophrenia and substance abuse. *Comprehensive Psychiatry*, 52(5), 490-497.
- Piquero, A. R., Farrington, D. P., & Blumstein, A. (2003). The criminal career paradigm. *Crime and Justice*, 30, 359-506.
- Piquero, N. L., & Sealock, M. D. (2004). Gender and general strain theory: A preliminary test of Broidy and Agnew's Gender/GST hypothesis. *JQ: Justice Quarterly*, 21(1), 125-158.
- Press, S. J., & Wilson, S. (1978). Choosing between logistic regression and discriminant analysis. *Journal of the American Statistical Association*, 73(364), 699-705.
- Quintero, G., Peterson, J., & Young, B. (2006). An exploratory study of socio-cultural factors contributing to prescription drug misuse among college students. *Journal of Drug Issues*, 36(4), 903-931.

- Ramlow, B. E., White, A. L., Watson, D. D., & Leukefeld, C. G. (1997). The needs of women with substance use problems: An expanded vision for treatment. *Substance Use & Misuse*, 32(10), 1395-1404.
- Rawson, R.; Shoptaw, S.J.; Obert, J.L.; McCann, M.J.; Hasson, A.L.; Marinelli-Casey, P.J.; Brethen, P.R.; and Ling, W. (1995). An intensive outpatient approach for cocaine abuse: The Matrix model. *Journal of Substance Abuse Treatment*, 12(2):117-127.
- Rawson, R.A.; Huber, A.; McCann, M.; Shoptaw, S.; Farabee, D.; Reiber, C.; and Ling, W. (2002). A comparison of contingency management and cognitive-behavioral approaches during methadone maintenance treatment for cocaine dependence. *Archives of General Psychiatry* 59(9):817-824, 2002.
- Reinarman, C., & Levine, H. G. (Eds.). (1997). *Crack in America: Demon drugs and social justice*. Berkeley and Los Angeles (CA): University of California Press.
- Rempel, M., & Destefano, C. D. (2002). Predictors of engagement in court-mandated treatment: Findings at the Brooklyn Treatment Court, 1996-2000. *Journal of Offender Rehabilitation*, 33(4), 87-124.
- Rempel, M., Green, M., & Kralstein, D. (2012). The impact of adult drug courts on crime and incarceration: findings from a multi-site quasi-experimental design. *Journal of Experimental Criminology*, 8(2), 165-192.
- Riani, M., and A. C. Atkinson. 2000. Robust diagnostic data analysis: Transformations in regression. *Technometrics*, 42, 384-394.
- Roll, J. M., Prendergast, M., Richardson, K., Burdon, W., & Ramirez, A. (2005). Identifying predictors of treatment outcome in a drug court program. *American Journal of Drug and Alcohol Abuse*, 31(4), 641-656.
- Roman, J., Townsend, W., & Bhati, A. S. (2003). *Recidivism rates For drug court graduates: Nationally based estimates*. Washington, DC: U.S. Department of Justice.
- Rosenberg, J., Mark, S., & No, P. B. (2011). *Balanced Justice: Policy brief 11*. New York: Institute for Policy Integrity: New York University School of Law
- Roskes, E., & Feldman, R. (1999). A collaborative community-based treatment program for offenders with mental illness. *Psychiatric Services*, 50(12), 1614-1619.
- Rossmann, S., Roman, J., Zweig, J., Rempel, M., & Lindquist, C. (2011). *The multi-site adult drug court evaluation: Executive summary*. <http://www.urban.org/UploadedPDF/412353-multi-site-adult-drug-court.pdf>
- Sacks, S., Banks, S., McKendrick, K., & Sacks, J. Y. (2008). Modified therapeutic community for co-occurring disorders: A summary of four studies. *Journal of Substance Abuse Treatment*, 34(1), 112-122.

- Sampson, R. J., & Laub, J. (1993). *Crime in the Making: Pathways and Turning Points through Life*. Cambridge, MA: Harvard University Press.
- Sampson, R. J., & Laub, J. (2003). Life-Course Desisters? Trajectories of Crime among Delinquent Boys Followed to Age 70. *Criminology*, 41 (3), 301-340.
- Sanford, J. S., & Arrigo, B. A. (2005). Lifting the cover on drug courts: Evaluation findings and policy concerns. *International Journal of Offender Therapy and Comparative Criminology*, 49(3), 239-259.
- Sarchiapone, M., Carli, V., Cuomo, C., Marchetti, M., & Roy, A. (2009). Association between childhood trauma and aggression in male prisoners. *Psychiatry Research*, 165(1), 187-192.
- Saum, C. A., Scarpitti, F. R., & Robbins, C. A. (2001). Violent offenders in drug court. *Journal of Drug Issues*, 31(1), 107-128.
- Schäfer, I., & Najavits, L. M. (2007). Clinical challenges in the treatment of patients with posttraumatic stress disorder and substance abuse. *Current Opinion in Psychiatry*, 20(6), 614-618.
- Schaeffer, C. M., Henggeler, S. W., Chapman, J. E., Halliday-Boykins, C. A., Cunningham, P. B., Randall, J., & Shapiro, S. B. (2010). Mechanisms of effectiveness in juvenile drug court: Altering risk processes associated with delinquency and substance abuse. *Drug Court Review*, 7(1), 57-94.
- Shaffer, D. K. (2011). Looking Inside the Black Box of Drug Courts: A Meta-Analytic Review. *Justice Quarterly*, 28(3), 493-521.
- Schiff, M. & Terry, W.C. (1997). Predicting graduation from Broward County's dedicated drug treatment court. *The Justice System Journal*, 19(3), 291-310.
- Schroeder, R. D., Giordano, P. C., & Cernkovich, S. A. (2007). Drug use and desistance processes. *Criminology*, 45(1), 191-222.
- Sechrest, D.K. & Shichor, D. (2001). Determinates of graduation from a day treatment drug court in California: A preliminary study. *Journal of Drug Issues*, 31(1), 129-148.
- Senjo, S. & Leip, L.A. (2001). Testing and developing theory in drug court: A four part logit model to predict drug court treatment. *Criminal Justice Policy Review*, 12 (1), 66-87.
- Sherbourne, C. D., & Stewart, A. L. (1991). The MOS social support survey. *Social Science & Medicine*, 32(6), 705-714.
- Spohn, C., & Holleran, D. (2002). The effect of imprisonment on recidivism rates of felony offenders: a focus on drug offenders*. *Criminology*, 40(2), 329-358.
- Spohn, C., Piper, R. K., Martin, T., & Frenzel, E. D. (2001). Drug courts and recidivism: The results of an evaluation using two comparison groups and multiple indicators of recidivism. *Journal of drug issues*, 31(1), 149-176.

- Spitzer, J. J. (1982). A primer on Box-Cox estimation. *The Review of Economics and Statistics*, 64(2), 307-313.
- Spjeldnes, S., Jung, H., Maguire, L., & Yamatani, H. (2012). Positive family social support: Counteracting negative effects of mental illness and substance abuse to reduce jail ex-inmate recidivism rates. *Journal of Human Behavior in the Social Environment*, 22(2), 130-147.
- Steadman, H. J., & Naples, M. (2005). Assessing the effectiveness of jail diversion programs for persons with serious mental illness and co-occurring substance use disorders. *Behavioral Sciences & the Law*, 23(2), 163-170.
- Steadman, H., Osher, F., Robbins, P. C., Case, B., & Samuels, S. (2009). Prevalence of serious mental illness among jail inmates. *Psychiatric Services*, 60 (6), 761-765.
- Steffensmeier, D., & Allan, E. (1996). Gender and crime: Toward a gendered theory of female offending. *Annual Review of Sociology*, 22, 459-487.
- Stewart, S. H., Pihl, R. O., Conrod, P. J., & Dongier, M. (1998). Functional associations among trauma, PTSD, and substance-related disorders. *Addictive Behaviors*, 23(6), 797-812.
- Stinchcomb, J. B. (2010). Drug courts: Conceptual foundation, empirical findings, and policy implications. *Drugs: Education, Prevention, and Policy*, 17(2), 148-167.
- Stover, C. S., Hall, C., McMahon, T. J., & Easton, C. J. (2012). Fathers entering substance abuse treatment: An examination of substance abuse, trauma symptoms and parenting behaviors. *Journal of Substance Abuse Treatment*, 43(3), 335-343.
- Subica, A. M., Claypoole, K. H., & Wylie, A. M. (2012). PTSD'S mediation of the relationships between trauma, depression, substance abuse, mental health, and physical health in individuals with severe mental illness: Evaluating a comprehensive model. *Schizophrenia Research*, 136(1), 104-109.
- Substance Abuse and Mental Health Services Administration, *Results from the 2011 National Survey on Drug Use and Health: Summary of national findings*, NSDUH Series H-44, HHS Publication No. (SMA) 12-4713. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2012.
- Sullivan, M. D., Edlund, M. J., Steffick, D., & Unützer, J. (2005). Regular use of prescribed opioids: association with common psychiatric disorders. *Pain*, 119(1), 95-103.
- Taxman, F. S., & Bouffard, J. A. (2000). The importance of systems in improving offender outcomes: New frontiers in treatment integrity. *Justice Research and Policy*, 2(2), 37-58.
- Thornberry, T. P., Lizotte, A. J., Krohn, M. D., Farnworth, M., & Jang, S. J. (1994). Delinquent Peers, Beliefs, And Delinquent Behavior: A Longitudinal Test Of Interactional Theory*. *Criminology*, 32(1), 47-83.

- Tomasino, V., Swanson, A. J., Nolan, J., & Shuman, H. I. (2001). The Key Extended Entry Program (KEEP): A methadone treatment program for opiate-dependent inmates. *The Mount Sinai Journal of Medicine, New York*, 68(1), 14.
- Tonry, M. H., & Wilson, J. Q. (Eds.). (1990). *Drugs and Crime* (Vol. 13). Chicago: University of Chicago Press.
- Trebach, A. S., & Inciardi, J. A. (1993). *Legalize it?: Debating American drug policy*. Washington, DC: American University Press.
- Triffleman, E. (2003). Issues in implementing posttraumatic stress disorder treatment outcome research in community-based treatment programs. In James L. Sorensen, Richard A. Rawson, Joseph Gudysh, and Joan E. Zweben (Eds.), *Drug abuse treatment through collaboration: Practice and research partnerships that work*, 227-247. Washington, DC: American Psychological Association.
- Triffleman, E. G., Marmar, C. R., Delucchi, K. L., & Ronfeldt, H. (1995). Childhood trauma and posttraumatic stress disorder in substance abuse inpatients. *The Journal of Nervous and Mental Disease*, 183(3), 172-176.
- Turner, S., Longshore, D., Wenzel, S., Deschenes, E., Greenwood, P., Fain, T., ... & McBride, D. (2002). A decade of drug treatment court research. *Substance Use & Misuse*, 37(12-13), 1489-1527.
- United States Department of Justice, Federal Bureau of Investigation. (September 2012). *Crime in the United States, 2011*. Washington, DC: Author.
- United States Department of Justice, Federal Bureau of Investigation. (September 2013). *Crime in the United States, 2012*. Washington, DC: Author.
- Velilla, S. 1993. A note on the multivariate Box–Cox transformation to normality. *Statistics and Probability Letters*, 17, 259–263.
- Vreven, D. L., Gudanowski, D. M., King, L. A., & King, D. W. (1995). The civilian version of the Mississippi PTSD Scale: A psychometric evaluation. *Journal of Traumatic Stress*, 8(1), 91-109.
- Walker, S. (2010). *Sense & Nonsense about Crime*. Stamford, CT: Cengage Learning.
- Warner, T. D., & Kramer, J. H. (2009). Closing the revolving door? Substance abuse treatment as an alternative to traditional sentencing for drug-dependent offenders. *Criminal Justice and Behavior*, 36(1), 89-109.
- Warr, M. (2002). *Companions in crime: The social aspects of criminal conduct*. Cambridge: Cambridge University Press.
- Warren, J. I., Stein, J. A., & Grella, C. E. (2007). Role of social support and self-efficacy in treatment outcomes among clients with co-occurring disorders. *Drug and Alcohol Dependence*, 89(2), 267-274.

- Webster, J. M., Rosen, P. J., Krietemeyer, J., Mateyoke-Scriver, A., Staton-Tindall, M., & Leukefeld, C. (2006). Gender, mental health, and treatment motivation in a drug court setting. *Journal of Psychoactive Drugs*, 38(4), 441-448.
- Wexler, H.K. 1994. Progress in prison substance abuse treatment: A 5 year report. *Journal of Drug Issues*, 24(2): 361-372.
- Wexler, D. B. (2001). Lowering the volume through legal doctrine: A promising path for therapeutic jurisprudence scholarship. *Florida Coastal Law Journal*, 3, 123.
- Weyandt, L. L., Janusis, G., Wilson, K. G., Verdi, G., Paquin, G., Lopes, J., ... & Dussault, C. (2009). Nonmedical prescription stimulant use among a sample of college students relationship with psychological variables. *Journal of Attention Disorders*, 13(3), 284-296.
- White, H. R., & Gorman, D. M. (2000). Dynamics of the drug-crime relationship. *Criminal Justice*, 1(15), 1-218.
- Wilson, D. B., Mitchell, O., & MacKenzie, D. L. (2006). A systematic review of drug court effects on recidivism. *Journal of Experimental Criminology*, 2(4), 459-487.
- Wilson, J. Q., & Petersilia, J. (Eds.). (2010). *Crime and public policy*. Oxford University Press.
- Wu, N. S., Schairer, L. C., Dellor, E., & Grella, C. (2010). Childhood trauma and health outcomes in adults with comorbid substance abuse and mental health disorders. *Addictive Behaviors*, 35(1), 68-71.
- Young, D., & Belenko, S. (2002). Program retention and perceived coercion in three models of mandatory drug treatment. *Journal of Drug Issues*, 32(1), 297-328.
- Zanis, D. A., Mulvaney, F., Coviello, D., Alterman, A. I., Savitz, B., & Thompson, W. (2003). The effectiveness of early parole to substance abuse treatment facilities on 24-month criminal recidivism. *Journal of Drug Issues*, 33(1), 223-235.
- Zweig, J. M., Rossman, S. B., Roman, J. K., Rempel, M., Lindquist, C. H., Roman, J.K., et al. (2011). *The Multi-Site Adult Drug Court: What's Happening with Drug Courts? A Portrait of Adult Drug Courts in 2004*. Washington, DC: The Urban Institute.

Appendix A: Extant Literature on Drug Court Outcomes

Demographics	Extant Literature
Gender	<p><u>No gender differences:</u></p> <ul style="list-style-type: none"> • Evans, Li, & Hyser, 2009 • Hepburn & Harvey, 2007 • Marlowe, et. al, 2003 • Seachrest, & Shicor, 2001 • Senjo & Leip, ,2001 <p><u>Males more likely to complete drug court:</u></p> <ul style="list-style-type: none"> • Belenko, 2001 <p><u>Females more likely to complete drug court:</u></p> <ul style="list-style-type: none"> • Gray & Saum, 2005 • Dannerbeck, Harris, Sundet, & Lloyd, 2006 • Hartman, Johnson Listwan, & Koetzle Shaffer, 2007
Employment	<p><u>Those employed more likely to complete:</u></p> <ul style="list-style-type: none"> • Butzin, Saum, & Scarpetti, 2002 • Zweig, et al., 2011
Age	<p><u>No age differences:</u></p> <ul style="list-style-type: none"> • DeMatteo, Marlowe, Festinger, & Arabia, 2009 • Gray & Saum, 2005 • Gallagher, 2013 • Miller & Shutt, 2001 • Roll, Pendergast, Richardson, Burdon, & Ramirez, 2005 • Shaffer et al., 2010 • Schiff & Terry, 1997 <p><u>Older adults more likely to complete:</u></p> <ul style="list-style-type: none"> • Cissner & Rempel, 2005 • Hartley & Phillips, 2001 • Hickert, Boyle & Tollefson, 2009 • Hepburn & Harvey, 2007 • Young and Belenko, 2002 <p><u>Younger adults more likely to complete:</u></p> <ul style="list-style-type: none"> • Senjo & Leip. 2001 <p><u>Younger adults less likely to complete:</u></p> <ul style="list-style-type: none"> • Dannerbeck, Harris, Sundet, & Lloyd, 2006 • Hickert, Boyle, & Tollefsen, 2009 • Logan, Williams, Leukefeld, & Minton, 2000 • Saum, Scarpitti, & Robbins, 2001

Demographics	Extant Literature
Education level	<p><u>No education differences:</u></p> <ul style="list-style-type: none"> • Senjo & Leip, 2001 • Hiller, Knight, & Simpson, 1999 • DeMatteo et al., 2009 • Gray & Saum, 2005 • Hepburn & Harvey, 2007; • Hickert, Boyle, & Tollefson, 2009; • Schaeffer et al., 2010; • Mullany & Peat, 2008; • Schiff & Terry, 1997
Psychosocial Characteristics	Extant Literature
Trauma	No studies specifically examine traumatic experiences in terms of drug court outcomes, but the literature on treatment completion indicates a negative relationship between traumatic stress experiences and successful completion of treatment.
MH	<p><u>No mental health differences:</u></p> <ul style="list-style-type: none"> • Dematteo, Marlowe, Festinger, & Arabia, 2009 • Cosden, et al, 2006 <p><u>More mental health symptoms less likely to complete:</u></p> <ul style="list-style-type: none"> • Cissner& Rempel , 2005 • Evans, Li, & Hser, 2009 • Garrity, et al, 2007 • Gray & Saum, 2005 • Hickert, Boyle, & Tollefson, 2007 • Hickert, et al, 2009 • Hiller, Knight, & Simpson, 1999 • Mendoza, Trinidad, Nochajaski, & Farrell, 2013
Social support	No studies specifically examine social support in terms of drug court outcomes, but a large amount of literature on treatment completion indicates a positive relationship between prosocial support mechanisms and successful completion of treatment.