

OVER A DECADE LATER: A QUASI-EXPERIMENTAL STUDY OF NORTH DAKOTA'S
JUVENILE DRUG COURTS

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ABSTRACT

Little is known about the long-term impact of juvenile drug court on recidivism. This study compares the adult recidivism rates among prior juvenile drug court participants against a comparison group of probated, but not drug courted juveniles. The study employed a twelve-year average follow up subsequent to participants in both groups reaching the age of majority (18). Outcomes examined included arrests, convictions, and both substance and violent convictions in adulthood. Logistic and linear regression models indicated no main effects of drug court into adulthood. However, gender appeared to be suppressing the effect of drug court on recidivism. Interaction terms indicated a vicious interaction with males in the drug court having slightly higher recidivism rates than comparison males and female drug court participants recording lower recidivism rates than comparison females. Some recommendations are made as far as modifying juvenile drug court based on these results.

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CHAPTER 1: INTRODUCTION

In 2013, approximately 2.1 million juveniles in the United States between the ages of 12 and 17 were users of illicit drugs. Of those youth, 1.3 million were identified as having substance dependency or substance use disorder. It was estimated that only 9.1 percent of those substance dependent youth received treatment, leaving approximately 1.2 million without treatment (Substance Abuse & Mental Health Services Administration [SAMHSA], 2014). The staggering numbers of juvenile drug use is not only a public health concern, it is also a major concern for the criminal justice system. In 2013, the juvenile justice system handled 1,058,500 juvenile cases, 13.3 percent of which were drug related offenses (Hockenberry & Puzanchera, 2015). The relationship between substance use and crime has been well established in previous literature (Dawkins, 1997; O'Donnell, 1966). Juvenile substance use increases the likelihood of delinquent behaviors (Loeber, Stouthamer-Loeber & White, 1999) and involvement with the criminal justice system (Butts & Roman, 2004; SAMHSA, 2014). Juveniles involved in the criminal justice system are also more likely to have greater dependency issues (SAMHSA, 2014). In an attempt to break the cycle of juvenile drug use and crime, juvenile drug courts were created. Juvenile drug courts represent a relatively new restorative justice approach to dealing with and treating substance use within the juvenile justice system (Butts & Roman, 2004).

Juvenile drug courts are specialized treatment courts that work within the juvenile justice system. Juvenile drug courts offer young offenders a chance to receive treatment to address their addictions (Butts & Roman, 2004). Although juvenile drug courts vary, the universal concept is that they work to provide intensive treatment and a comprehensive collaboration of services to youth who have been identified as having a substance abuse problem (Butts & Roman, 2004; Cooper, 2001). If juveniles successfully complete drug court programs and remain drug free,

their criminal charges are usually reduced or dismissed (Butts & Roman, 2004). Since the conception of juvenile drug courts in 1995, they have grown nationally in usage and popularity. In 2014, 433 juvenile drug courts were operating in the United States (National Drug Court Resource Center [NDCRC], 2014). Juvenile drug courts are a part of the national drug court movement, inspired by the first adult drug court created in Florida in 1989 (Butts & Roman, 2004; Goldkamp & Weiland, 1993).

The first drug court began operation in Dade County Florida in 1989 in response to the overwhelming amount of drug related caseloads. The national ‘war on drugs’ had caused an overflow of drug related caseloads, which clogged up the court dockets and facilities. The first few adult drug courts successfully reduced drug related caseloads in criminal courts and effectively treated substance abuse. The success of adult drug courts prompted them to be implemented nationally (NDCRC, 2014). The expansion and support of drug courts assisted the movement away from punishment and punitive sanctions, and created a focus on preventing future criminal acts by treating offenders who were at the highest risk of recidivism (Franco, 2011; Harrell, 2003). Drug courts focus on providing offenders with treatment to address underlying addictions and dependencies to prevent future recidivism (Butts & Roman, 2004; Franco, 2011; Rosenthal, 2002). Numerous evaluations of adult drug courts have been conducted and have determined that adult drug courts significantly reduce substance use and future recidivism (Marlowe, 2010).

After the success of adult courts, specialized court dockets modeling the adult drug courts began to form. The first juvenile drug courts emerged in the mid-1990’s and quickly became popular and gained national support (National Drug Court Institute [NDCI], 2003). Juvenile drug courts were implemented in many jurisdictions across America without appropriate empirical

research on their effectiveness. Empirical research on juvenile drug court effectiveness has significantly lagged behind and failed to keep up with the rapid growth and expansion of juvenile drug courts (Butts & Roman, 2004; Lowenkamp, Holsinger, & Latessa, 2005; Marlowe, 2010B; Roman & DeStefano, 2004). As current research begins to catch up, it has shown mixed findings for juvenile drug court effectiveness (Marlowe, 2010B; Mitchell, Wilson, Eggers, & MacKenzie, 2012; Stein, Homan, & DeBerard, 2015; Sullivan, Blair, Latessa, & Sullivan, 2014; Tanner-Smith, Lipsey, & Wilson, 2016). Not only does the research present inconclusive results, there is also a very evident and problematic gap in the current available juvenile drug court literature. There is a lack of long-term studies and therefore the long-term effects of these courts remain unknown (Belenko, 1998, 2001; Belenko & Dembo, 2003; Latimer et al., 2006; Mitchell et al., 2012; Thompson, 2004).

While a majority of multiple and single site evaluations of juvenile drug courts suggest juvenile drug courts have a small to moderate effect size (Anspach et al., 2003; Brewster, 2001; Carey et al., 2006; Harrison et al., 2006; Hickert et al., 2010; NPR Research, 2006; Pitts, 2006; Rodriguez & Webb, 2004), some studies found juvenile drug court participants to fare no better or even worse than their comparison groups (Sloan et al., 2004; Sullivan et al., 2014). These evaluations commonly used a juvenile drug court group and compared their recidivism rates to those of similar juveniles who went through the traditional court system. A 12- month evaluation study of juvenile drug court participants and similar non-drug court juveniles found that non-drug court participants recidivated at a significantly higher rate compared to the juvenile drug court participants (Anspach et al., 2003). Similar findings were found when juvenile and adult recidivism rates of juvenile drug court participants were examined over a time period of 16 to 40 months. Drug court participants had a recidivism rate of 37.1 percent compared to the traditional

juvenile probation group who had a recidivism rate of 55.7 percent (Pitts, 2006). A significant difference in recidivism rates was found in a recent evaluation of six juvenile drug courts in Utah. After a 30 month follow up period there was a significant difference in recidivism rates between the drug court group and the comparison group, but there was a difference in outcomes based on gender. The study suggested that males were almost twice as likely than females to obtain a criminal charge after leaving the program (Hickert et al., 2010).

Although most of the evaluations available to juvenile drug court literature found juvenile drug courts have a small to moderate effect size of recidivism rates (Anspach et al., 2003; Brewster, 2001; Harrison et al., 2006; Hickert et al., 2010; NPR Research, 2006; Rodriguez & Webb, 2004), not all evaluations have found juvenile drug courts to be an effective intervention. One of the largest national drug court evaluations looked at nine independent juvenile drug courts. Results showed that juvenile drug court participants had a 60 percent recidivism rate while juveniles who went through the traditional court system had a 49 percent recidivism rate (Sullivan et al., 2014). Another study of juvenile drug court participants found that juvenile drug court participation had no effect on recidivism rates, but males were 1.24 times more likely to recidivate compared to female participants (Sloan et al., 2004). Overall, the research provides mixed results on how effective juvenile drug courts are at reducing juvenile's future recidivism rates.

Meta-analyses and larger studies tend to suggest that juvenile drug courts have little to no impact on reducing juvenile substance use and recidivism (Latimer et al., 2006; Mitchell et al., 2012; Shaffer, 2006; Stein et al., 2015; Tanner-Smith, Lipsey, & Wilson, 2016). Due to the lag in juvenile justice research, only a handful of meta-analysis on the effectiveness of juvenile drug courts have been conducted. The most recent and comprehensive systematic review of literature

examined 41 studies of juvenile drug courts to determine effect sizes on recidivism rates, drug-related recidivism, drug court characteristics and participant drug use. The overall findings suggested that juvenile drug courts were neither more or less effective at reducing recidivism rates, drug related recidivism, or participant drug use (Tanner-Smith, Lipsey, & Wilson, 2016). In 2015, a large analysis of juvenile drug courts looked at 31 studies and found that the juvenile drug courts had only a small effect size on recidivism rates. In general the literature suggested that females did better in the juvenile drug courts in contrast to male participants. An important research finding of this study found that the mean difference between the groups increased with time, suggesting the need for longer follow up periods in juvenile drug court research (Stein et al., 2015). Mitchell et al., (2012) found similar results in their meta-analysis of 34 juvenile drug courts. Juvenile drug court participants fared significantly better than comparison group for general recidivism rates, but when drug related recidivism was evaluated, there was not significant difference between the groups (Mitchell et al., 2012). The results of Shaffer's (2006) meta-analysis, suggested juvenile drug court participants had significantly lower recidivism rates compared to the comparison group, but when the study's outliers were removed, the confidence interval fell to include zero (0.00 - 0.08). Shaffer also addressed the importance of looking at what role gender plays in the success of the participants and their recidivism outcomes (Shaffer, 2006). The negative results of Latimer and colleagues' (2006) study lead them to the conclusion that juvenile drug courts are not an effective intervention and juvenile drug courts may not be suitable for a juvenile offender population (Latimer, Morton-Bourgon, & Chretien, 2006).

The only meta-analysis that found promising results was conducted by Aos, Miller and Drake (2006). The results of their analysis of 15 studies suggested that juvenile drug courts significantly reduced recidivism rates and were a cost beneficial and effective option for the state

of Washington (Aos et al., 2006). While the meta-analysis conducted by Aos et al., (2006) was the only study to suggest juvenile drug courts are very effective, other studies found a modest to no effect size, suggesting that juvenile drug courts may be an effective intervention for juvenile offenders, but effect sizes are too small to know for sure (Mitchell et al., 2012; Latimer et al., 2006; Shaffer, 2006; Stein et al., 2015; Tanner-Smith, Lipsey, & Wilson, 2016).

Not only is effectiveness of juvenile drug courts unclear, the long-term effects of juvenile drug courts remain essentially unknown (Mitchell et al., 2012). Juvenile drug court literature lacks appropriate long-term follow up periods and there is little knowledge about how juvenile drug courts effect recidivism rates when the participants become mature adults (Belenko, 1998, 2001; Mitchell et al., 2012). The lack of long-term evaluations in juvenile drug court literature is problematic because previous studies have shown that effect sizes of juvenile drug courts increase over greater lengths of time (Latimer et al., 2006; Lowenkamp et al., 2005) and the likelihood of recidivism decreases with age (Harrison et al., 2006; Sullivan et al., 2014). The longest known follow up periods in published juvenile drug court literature are found in Thompson's (2004) study which included a four year follow up time period after program completion and Cook, Watson and Stageberg's (2009) study that used a four and a half year follow up time, beginning at the time of program entry.

Thompson's (2004) four year study found that juvenile drug court graduates fared significantly better than drug court non-completers and the comparison group in one region of North Dakota. But in another region, the comparison groups had lower recidivism rates than drug court graduates and drug court non-completers. The results also found that male participants were more likely to have a Class A misdemeanor conviction compared to female participants. This four year follow up study suggested that juvenile drug courts can be an effective

intervention, but program characteristics strongly influence the program's effects on future recidivism (Thompson, 2004). The only other long term juvenile drug court evaluation known to this author was Cook, Watson and Stageberg's (2009) evaluation of juvenile drug court's effect on recidivism over a four and a half year time period. At the end of the follow up period, program non-completers had the highest rate of recidivism (77.6%), then juvenile drug court graduates (73.2%) followed by and the comparison group who had the lowest recidivism rate (72.1%). The overall results found no statistically significant difference between groups, suggesting juvenile drug courts were not an effective intervention (Cook et al., 2009). These two studies (Cook et al., 2009; Thompson, 2004) used longest follow up periods in published juvenile drug court research. The differences in these study's findings highlight the need for further research of the long-term effects of juvenile drug courts.

The long-term effects of juvenile drug courts remain unknown (Mitchell et al., 2012), and represents a large gap in juvenile drug court literature, evaluation and understanding. It is very important that the long-term effects of juvenile drug courts are studied, because as of now researchers, policy makers, and practitioners have no information about how juvenile drug courts might affect recidivism in later adulthood. Stien et al., (2015) found that mean differences between drug court participants and comparison group recidivism increased in favor of drug courts as time increased. Juvenile drug courts may or may not show any affect in adulthood, but the point of the matter is that juvenile drug courts are being used in numerous states across America. If juvenile drug courts have any long-term effects, it is valuable knowledge for research, policy makers and criminal justice practitioners.

The Current Study

To date, no published study known to this author has looked at what effects juvenile drug courts have on recidivism using a follow up time period greater than four and a half years. The purpose of this present study is to explore any possible long-term effects juvenile drug courts have on recidivism as youths pass into adulthood. This study will use secondary data from North Dakota's juvenile court system to compare long-term recidivism rates of individuals who did participate in juvenile drug court and those who were deemed eligible but went through the traditional juvenile court system instead.

Due to the unclear effects juvenile drug courts have on future recidivism, as well as the lack of long-term studies, the present study will act as an exploratory study. This study will use over a 10 year follow up period, to examine any possible differences in recidivism rates and trends in recidivism of past juvenile drug court participants compared to similar individuals who did not participate in juvenile drug court. Because past literature has shown that gender seems to be an influential factor juvenile drug court success and recidivism rates (Carey, Waller, & Marchand, 2006; Hickert, Becker, & Prospero, 2010; Latessa, Shaffer, & Lowenkamp, 2002; Sloan, Smykla, & Rush, 2004; Sullivan, Blair, Latessa, & Sullivan, 2014; Thompson, 2004), this study will also examine the influence of gender on adulthood recidivism within the juvenile drug court group and the comparison group.

Research Questions

The research questions driving this study are devised from previous literature but are created to have a broad focus due to the deficiency of knowledge about the long-term effects of juvenile drug courts. The research questions are as follows: (1) Does juvenile drug court participation affect the likelihood and frequency of adulthood arrests? (2) Does juvenile drug

court participation affect the likelihood and frequency of adulthood convictions? (3) Does gender impact the recidivism outcomes for the juvenile drug court group and the comparison group? (4) Does graduation from juvenile drug court have any effect on adult recidivism in comparison to non-completers of juvenile drug court?

This paper will first thoroughly review the history of adult drug courts and the success of adult drug courts in order to provide a framework for understanding the genesis of juvenile drug courts. Next, the general features of juvenile drug courts will be discussed along with the theoretical framework behind them. Finally, a comprehensive literature review of juvenile drug court evaluations and studies will be presented and explored. This study will provide further description of the study's participants and North Dakota juvenile drug courts, followed by a description of the methods used in the study. The results of the study will be analyzed and discussed, as will the limitations of this study and the policy implications.

CHAPTER 2: REVIEW OF THE LITERATURE

History of Adult Drug Courts

To have a comprehensive understanding of juvenile drug courts, it is imperative to understand where they originated from, adult drug courts. During the 1980's, the United States experienced an immense growth of drug related caseloads within the court systems (Goldkamp & Weiland, 1993). The 'war on drugs' caused courts dockets, holding cells and jails to become clogged and overrun with non-violent offenders with drug-related charges (Lurigio, 2008). The cycle of drug use and crime did not only cause challenges within the criminal court system, but also for public safety (Goldkamp & Weiland, 1993B). In response to the overwhelming amount of drug users in the criminal justice system, the first drug court in the Eleventh Judicial Circuit was implemented in Dade County, Florida in 1989. The drug court was created to be a flexible program that used a court-supervised approach to break the cycle of drug use and criminal behavior. This design became known as the Miami Drug Court Model (Goldkamp & Weiland, 1993B).

The Miami Drug Court Model provided a historical shift in criminal justice. It changed how the system approached the relationship of drug addiction and crime. Instead of criminalizing drug use, drug courts began working to treat offenders' underlying addictions and dependencies (Butts & Roman, 2004; Franco, 2011; Rosenthal, 2002). This overall shift, modeled the adoption of the therapeutic jurisprudence model within criminal justice. Therapeutic jurisprudence, originally created as a legal theory, is the study of how law can act as a therapeutic agent. In the case of drug courts, drug courts represent the law as the working therapeutic agent to enhance the wellbeing of the offenders by treating substance abuse addictions (Hora, Schma, & Rosenthal, 1999). The paradigm shift produced by the first drug court assisted the movement of problem

solving courts, whereas focus was shifted away from punitive sanctioning, and greater emphasis was placed on preventing future criminal acts by treating those who are at the highest risk of recidivism, such as drug addicts (Franco, 2011; Harrell, 2003).

The Miami Drug Court Model

Goldkamp and Wieland (1993B) described the Miami Drug Court Model in detail in their original study of the program. The original model included two key components, outpatient drug abuse treatment and the role of courtroom officials. The role of the courtroom officials diverged from the traditional roles and responsibilities, as the judge took a supervisory role. Judges were involved in all steps of the drug court model, from program entry to the graduation ceremonies. The judge required routine check ins with the defendants to discuss their progress and allowed the defendant to express any of their concerns or explanations for certain behaviors or actions. The judge provided encouragement if appropriate as well as sanctions for program violations or inappropriate behavior. The roles of other courtroom officials were also unorthodox compared to the normal courtroom settings. Their roles were to support the judge and to assist in the defendants' treatment throughout the program stages. The prosecutor provided motivation and encouragement to participants when they showed positive progress. If participants did not engage in treatment or displayed inappropriate behaviors the prosecutor would proceed with formal prosecution of their charges in criminal court. The defense attorney played a very therapeutic role, as he or she supported the defendant to comply with the program rules and expectations. Representatives from pre-trial services and from the defendant's treatment services also attended court meetings to act as a team-oriented unit (Goldkamp & Weiland, 1993B).

The other key component of the Miami Drug Court Model was the outpatient treatment program, the Diversion and Treatment Program (DATP). The program was designed to address

addiction problems for non-violent first time offenders. The DATP required a minimum of one year of treatment for those in the drug court. The DATP included three phases, phase one entailed detoxification, phase two was counseling, and phase three was educational and vocational assessments and training. Once a defendant completed the three phases, they successfully graduated from the treatment program (Goldkamp & Weiland, 1993B).

The first outcome evaluation of the Miami Drug Court Model was conducted using a non-equivalent group comparison design over an 18-month time period (Goldkamp & Weiland (1993,1993B). The use of an experimental design was not feasible for the study, therefore multiple sample groups were used to represent those in drug court and those not in drug court, as well as subcategories for non-drug cases (Goldkamp & Weiland, 1993B). All 326 drug court participants made up sample group one and sample group two (n=89) included those who were eligible for drug court but did not participant. Sample group three (n=199) included defendants who were charged with felony drug cases but were not eligible for drug court and sample four (n=185) included offenders with non-drug felony cases. An additional two samples were added to increase before and after comparisons. These samples included defendants with drug cases (n=302) and defendants with non-drug felony cases (n=536) from three years prior to the start of the drug court (Goldkamp & Weiland, 1993B).

After allowing for an 18-month observation period, Goldkamp and Weiland (1993, 1993B) compared the drug court participants to the comparison groups. The major findings of the study suggested that drug court defendants had fewer dropped cases, but drug court participants tended to have higher failure-to-appear rates compared to non-drug court participants. Although this was a negative finding, it was justified by the fact that drug court participants were required to appear much more frequently than the comparison groups, therefore

the drug court participants had more opportunities to fail-to-appear. Drug court participants had lower incarceration rates, less frequent arrests and had a delayed time between program completion and subsequent arrests. Of the drug court participants that did offend, they showed a considerable time delay, as the average amount of time until first arrest was 235 days, almost three times longer than the other groups (Goldkamp & Wieland, 1993B). The results of the program evaluation provided promising results for the Miami Drug Court, and paved the way for future drug courts in other districts (Goldkamp & Weiland, 1993, 1993B). The promising findings produced by this evaluation were a large part of the further implementation of drug courts around the nation.

Success of Adult Drug Courts

In 2014, nearly 25 years after the first drug court was implemented, there were 1,538 adult drug courts operating in the United States (NDCRC, 2014). Adult drug courts vary between jurisdictions, but all tend to share similar features including outpatient substance use treatment, expedited case processing, drug testing, intensive supervision and additional support services (Franco, 2001; Lurigio, 2008). The primary goals of current day adult drug courts include, (1) reduce offender's substance use, (2) reduce recidivism, (3) provide rehabilitative services to participants and (4) reintegrate offenders back into society (Franco, 2011). The success of adult drug courts is well documented (Aos, Miller, & Drake, 2006; Downey & Roman, 2010; Huddleston & Marlowe, 2011; Huddleston, Marlowe, & Casebolt, 2008; Latimer et al., 2006; Lowekamp et al., 2005; Marlowe, 2010; Mitchell et al., 2012; Shaffer, 2010; Wilson, Mitchell, & MacKenzie, 2006) and has become one of the most studied phenomenon's in criminal justice (Marlowe, 2010). Marlowe (2010) reported on the findings of multiple meta-analyses which suggested that on average, adult drug courts significantly reduce recidivism rates by 10 to 15

percent. A meta-analysis of 92 adult drug courts found that adult drug participants had a statistically significant lower recidivism rate of 37.6 percent, compared to a 50 percent recidivism rate for comparison groups (Mitchell et al., 2012). Marlowe (2010) stated that, “We know beyond a reasonable doubt that drug courts significantly reduce drug use and crime and do so with substantial cost savings,” (p. 1). Despite the wealth of literature on adult drug courts, few studies have looked at the long-term impacts drug courts have on recidivism rates (Lowenkamp et al., 2005).

Long-term Evaluations of Adult Drug Courts

Lowenkamp and colleagues (2005) suggested that longer follow up periods greater than two years have shown the greatest effect sizes, yet few studies have looked at the long-term impacts of adult drug courts. To address this lack of knowledge Krebs, Lindquist, Koetse and Lattimore (2007) conducted a quasi-experimental study of drug court offenders to evaluate recidivism rates in a 30 month follow up time period. The sample was made up of 274 drug court participants, and 201 matched drug involved offenders in Hillsborough, Florida. The study used repeated measures every six months to assess recidivism through self-reported data and administrative records. The results of their study found that drug court participation was associated with a significant decrease in recidivism only during the 12 to 18 months after the baseline time period. During this time period, non-drug court participants were 2.04 times more likely than drug court participants to recidivate. After 18 months, the association was no longer significant. Although the findings were no longer significant after 18 months, the authors suggested that drug court participants were more likely to continue to refrain from recidivism compared to the others who did not participate in drug court (Krebs et al., 2007).

The evaluation of the Multnomah County Drug Court in Portland, Oregon allowed researchers to assess long-term impacts of the adult drug court program (Finigan, Carey, & Cox, 2007). This evaluation used the entire population of offenders within the Multnomah Court District that were identified as being drug court eligible. Data was collected from the year 1991 to 2001. The total sample included 11,000 cases, 6,500 of those cases had participated in the drug court program and the other 4,600 went through the criminal court. The evaluators conducted the follow up study in late 2005 and early 2006, which allowed for a minimum follow up time of five years for some offenders, while others exceeded ten years. The results found that compared to those who did not participate in drug court, drug court participants had significantly lower recidivism rates for up to 14 years after program entry. The results also found that the program was very cost beneficial as the estimated cost savings from drug court participants was more than \$79 million dollars for the ten year time period (Finigan et al., 2007). Although more information is needed on the long-term impacts of adult drug courts, the available literature suggests that they do have a long lasting impact on participant recidivism rates (Finigan et al., 2007; Krebs et al., 2007; Lowekamp et al., 2005).

Since the first drug court was implemented, many studies have looked at the effectiveness of adult drug courts. Many evaluations, government reports and studies have found that adult drug courts reduce recidivism and effectively address offenders' substance use (Huddleston & Marlowe, 2011; Huddleston et al., 2008; Marlowe, 2010). Few studies have looked at the long-term impacts of adult drug courts (Finigan et al., 2007; Krebs et al., 2007) and additional studies are still needed in order to provide a comprehensive understanding of the long-term effects associated with adult drug courts (Lowekamp et al., 2005). Meta-analyses have found that although drug courts are by no means perfect, and they don't work for everyone, there is strong

support for their effectiveness and they remain an important part of addressing drug users within the criminal justice system (Aos et al., 2006; Downey & Roman, 2010; Latimer et al., 2006; Lowenkamp et al., 2005; Mitchell et al., 2012; Wilson et al., 2006).

Juvenile Drug Courts

After the original success of adult drug courts, the same models and designs that worked for adult drug users were assumed to also work for juvenile drug offenders. It had been well documented that prolonged substance abuse is strongly correlated with criminal behavior and increases the chances of involvement in the juvenile criminal justice system (Butts & Roman, 2004; Loeber et al., 1999; SAMHSA, 2014). Juvenile drug courts seemed like a good way to intervene and reduce substance abuse and the crime cycle among juveniles. In the mid-1990's juvenile drug courts dockets began to form. The first juvenile drug court was implemented in 1995, and just six years later over 140 juvenile drug courts had been established (National Drug Court Institute [NDCI], 2003). As of 2014, there were 433 juvenile drug courts in existence nationwide (NDCRC, 2014). In the early stages of juvenile drug courts, it quickly became evident that simply applying adult drug court models to a youth population was not effective, and further studies and exploratory knowledge was needed (NDCI, 2003). But much like other popular trends throughout history, juvenile drug courts became a 'hit sensation' and were implemented very quickly (Butts & Roman, 2004).

Lowenkamp and colleagues (2005) stated that, "The field of criminal justice, and corrections in particular, has a history of panaceaphilia, an inclination to blindly support the latest and greatest treatment intervention regardless of what is empirically known about the program," (pg. 1). This quote demonstrates what happened with juvenile drug courts as research on juvenile drug courts has been sparse in relation to their popularity and use (Lowenkamp et al.,

2005; Marlowe, 2010B; Roman & DeStefano, 2004). As research begins to catch up, empirical evidence has shown mixed findings for juvenile drug courts (Marlowe, 2010B; Mitchell et al., 2012; Stein et al., 2015; Sullivan et al., 2014). In order to address the current juvenile drug court literature, this paper will first describe the general features of juvenile drug courts followed by an examination of the theoretical framework of juvenile drug courts. After these sections, a review of previous studies will demonstrate the mixed findings of juvenile drug court effectiveness.

General Features of Juvenile Drug Courts

Comparing juvenile drug courts can be difficult, as many drug court policies and procedures vary depending on budget, resources available, caseload sizes and other factors (Rossman, Butts, Roman, DeStefano, & White, 2004). Although not one drug court is exactly the same, the main concept of juvenile drug courts is that they work within juvenile courts and provide intensive treatment and a comprehensive collaboration of services to youth offenders who have substance abuse problems (Butts & Roman, 2004; Cooper, 2001). Juvenile drug courts are usually voluntary to participate in and tend to focus on juveniles that are not a high risk to the community and have a strong to moderate substance abuse dependency (Cooper, 2002).

Common key elements of juvenile drug courts include: (1) early identification and intervention of eligible youth offenders, (2) a diverse drug court team which includes a judge, treatment provider, school representative, prosecutor, defense attorney and parents or guardians of the offender, (3) integrated use of substance abuse treatment as well as other necessary treatments that address any additional needs, (4) ongoing judicial monitoring including frequent drug tests, (5) the use of a rewards and sanctions model to reward good behavior and discourage noncompliance, (6) some type of reduction or dismissal of the juvenile's current criminal offense upon program completion (7) and an overall focus and philosophy of using strength based

approaches to identify the strengths of the juvenile and their family (Copper, 2001, 2002; The National Association of Drug Court Professionals [NADCP], 1997). With these key concepts in mind, it is important to remember that juvenile drug courts can vary greatly in regards to their key components including screening and evaluation, target populations, eligibility requirements and program goals (Sloan & Smykla, 2003).

Juvenile drug courts do not represent the traditional components of the criminal justice system such as incapacitation and deterrence (Rosenthal, 2002). Instead juvenile drug courts work to achieve substance abstinence and enhancing the wellbeing of juveniles by addressing contributing problems to their substance use. This is done by addressing the needs of offenders which then leads to the creation of opportunities for them to live drug free and crime free lives. Juvenile drug courts aim to enhance juveniles' abilities and skills, increase self-worth and self-esteem, develop strong educational skills and create positive relationships and bonds with their community. The juvenile drug court team not only focuses on monitoring and providing support and structure for the juvenile, but also provides support for their families (Cooper, 2002). Providing this wrap around model of intervention represents a very comprehensive style of treatment to address juvenile substance abuse and the needs associated with a juvenile population.

It takes strong community partnerships between services to provide effective treatment to address the variety of needs in a juvenile's life as well as the unique challenges of youth populations (Rossman et al., 2004). Juvenile drug courts face unique challenges presented by the juvenile populations (Roberts, Brophy, & Cooper, 1997). Many of these strains are not found in adult drug courts. These challenges include the need to address family members or other people living in the juvenile's household, especially those with substance abuse along with the influence

of negative peers. Another added challenge for the program team is finding ways to effectively motivate juveniles to change their behaviors and attitudes while dealing with different maturity levels and vulnerabilities (Roberts et al., 1997). Juvenile drug court participants also reported education, family circumstances, mental health, housing, employment and physical health as some of their essential needs that were not being met (Latessa, Shaffer, & Lowenkamp, 2002). These issues are addressed through wrap around services including outpatient treatment for substance use and treatment for the families. School systems frequently provide additional support around the academic success of juvenile drug court participants. Law enforcement, public health programs, social services and community resources such as youth recreational programs and faith based programs are commonly apart of the drug court process and offer support and opportunities to drug court participants and their families (Drug Court Clearinghouse and Technical Assistance Project [DCCTAP], 1996). How these additional challenges are addressed, as well as the theoretical framework of drug courts can be further explored by examining juvenile drug courts through a restorative justice perspective.

Theoretical Framework of Juvenile Drug Courts

Restorative justice emerged as a movement within social work practices in the 1970's, in response to an overly harsh and punitive criminal justice system that was failing to reduce crime through deterrence and punishment (Menkel-Meadow, 2007). Braithwaite (1999) was one of the first researchers to theorize restorative justice and presented a new outlook on crime and corrections. Braithwaite (1999) believed that crime itself was a chance to prevent further wrongdoings by confronting behavior with grace and supporting individuals towards a positive crime free life. Restorative justice theory has found its way into specialized courts, including drug courts. Although drug courts were originally created without any theoretical foundation

(Fulkerson, 2009) the basic principles, goals and techniques found in restorative justice provides a theoretical framework for drug courts and helps explain their intended outcomes (Fulkerson, 2009; Miethe, Lu, & Reese, 2000; Menkel-Meadow, 2007). Restorative justice theory will first be discussed, followed by how restorative justice can be applied to drug courts. Then specific techniques of restorative justice including therapeutic jurisprudence, strength based approaches and reintegrative shaming and how they apply to juvenile drug courts will be discussed in detail.

Restorative Justice

The framework of restorative justice places equal concern and focus on the victim of the crime, the offender and the community (Braithwaite, 1999). At the Eighth World Congress of Criminology it was stated that, “Restorative justice is a new way of looking at criminal justice that focuses on repairing the harm done to people and relationships rather than on punishing offenders,” (McCold & Wachtel, 2003, p. 1). Although there are many different forms of restorative justice, the main concepts include some type of mediated communication between the victims and offenders, an explanation of the harm done by the crime, acknowledgment and acceptance of the crime committed, a chance for the offenders’ voice to be heard, appropriate restitution, and reintegration of the offender back into the community (Braithwaite, 1999; Menkel-Meadow, 2007). The act and the offender are considered separate, as the act of the crime is disapproved of, but the offender is not seen as a bad person. This allows the offender to make right of his or her wrongs and focus on the future, including rebuilding relationships and reintegration back into the community (Menkel-Meadow, 2007). Another key element of restorative justice includes accountability. Accountability has two different meanings within restorative justice. It has a cognitive meaning, where the offender understands how their behavior and the crime impacted others, and it also has a behavioral meaning, where the offender

takes action or changes their behaviors to make things right and problem solve for the future (Umbreit, 1995). Ultimately, restorative justice works to restore harm caused by the crime, rebuild relationships and create a better community (Braithwaite, 1999; McCold & Wachtel, 2003; Menkel-Meadow, 2007).

Restorative Justice and Juvenile Drug Courts

The drug court design embodies many elements of restorative justice as it works to restore the harms caused by substance abuse (Fulkerson, 2009). Restorative justice has three main focuses; the offender, the victim and the community (Braithwaite, 1989). All three focuses can be found within the drug court model. The focus of the offender and community involvement can easily be seen in the drug court model in the comprehensive treatment, the courtroom setting and the drug court team. However, the victim component is not as apparent. Drug courts do not usually involve the victims of the crime, or in many cases, drug crimes are considered victimless crimes (Fulkerson, 2009). Bazemore (1999) argues that drug crimes do in fact have victims, as drug crimes damage relationships. Addiction and crime can cause families, relationships and even the offender themselves to become the victims. There is a fine and sometimes frayed line between offenders and victims, as victims can be offenders and offenders can be victims. Therefore, drug courts work to address the harms to the victims or the offenders themselves by rebuilding relationships and restoring families that were damaged by the substance use (Fulkerson, 2009). The three main elements of restorative justice can arguably be found in juvenile drug courts.

Menkel-Meadow (2007) suggested that restorative justice represents a philosophy, an idea or a set of values to address crime and does not have a concrete set of processes or uniform practices. Drug court models embrace the principles of restorative justice, and allow for a

theoretical application to better understand how drug courts function and work. Fulkerson (2009) stated,

“The goals of the DTC [drug treatment courts] are to interrupt the recurring pattern of addiction and criminal behavior, restore the person to a life without drugs and crime, help the addict accept responsibility for her actions, restore drug addicts to their families, make society safer and repaired the harm cause by drug addiction. These are all the aims of restorative justice” (p. 264).

Restorative justice acts as an umbrella for many other related theories, which work within restorative justice. For juvenile drug courts, the use of therapeutic jurisprudence (Hora et al., 1999), reintegrative shaming (Braithwaite, 1989, 2000, 2002) and strength based approaches (Weick, Rapp, Sullivan, & Kisthardt, 1989) fall under the umbrella of restorative justice and are essential components of the juvenile drug court model.

Therapeutic Jurisprudence and Juvenile Drug Courts

Juvenile drug courts represent the application of the legal model of therapeutic jurisprudence (Rosenthal, 2002). Therapeutic jurisprudence is the idea that the law works as a therapeutic agent to enhance the offenders’ wellbeing (Hora et al., 1999). Therapeutic jurisprudence allows for the courts to view drug abuse or addiction as a disease or a maladaptive behavior in which the individual cannot rationally control. The underlying problem and possibly the root to their criminal behavior is their drug problem. The courts are able to treat offenders’ addictions or destructive behaviors through mandated substance abuse treatment. The end goal being to eliminate the offender’s substance use, restore them back into their community, allow them to become productive citizens and live crime free lives (Rosenthal, 2002). Therapeutic jurisprudence provides a model for how the courts can be used to provide treatment for

offenders, but does not fully explain how this treatment and reintegration of offenders back into society is accomplished. Strength based approaches and reintegrative shaming theory provide a greater theoretical understanding to how drug court offenders are rehabilitated.

Strength Based Approaches

The strength based approach is an organizing principle of many different practices and techniques. All these approaches focus on the positive characteristics, capabilities, and untapped gifts of individuals and their families (Nissen, 2006). Strength based approaches encourage programs to view offenders as being able to change, and can do so by focusing on their strengths, interests and assets which can ultimately cultivate drug free, crime free, and pro-social identities. Juvenile justice literature has lacked research around strength based approaches, which has ultimately lead to these approaches being underutilized (Nissen, 2006). Many juvenile justice programs simply focus on the problems. They become so focused on the faults and failures of the juveniles, they are not able to see the strengths, abilities, and skills juveniles already have (Clark, 1999). These types of deficit-based approaches have not been effective when working with juveniles (NDCI, 2003).

Strength Based Approaches and Juvenile Drug Courts

Juvenile drug courts have recognized the failure of deficit-based approaches and have moved to the idea that although juvenile offenders and their families may have problems, they also have the strengths and resources needed to overcome their challenges and make positive life changes (NDCI, 2003). The use of strength based practices focus on action and change, and a belief that responsibility for the past action is assumed when the juvenile begins to change their behaviors (Clark, 1999). Umbreit (1995) explained that when working with juveniles it is more important to focus on the future rather than place blame for their past behavior. When juveniles

begin to change their behaviors, attitudes, and ways of thinking for the better, they are taking responsibility for their past actions. This allows for a focus of hope on the future, while also allowing the youth to repair and make right their past actions (NDCI, 2003). Strength based approaches allow for a variety of practices and techniques to be used to focus on the individuals' strengths, positive behaviors, and talents. The individuals can use their strengths to overcome issues or challenges they face in their life.

These principles are based on the belief that everyone has strengths and their strengths can be used to turn challenges into opportunities to learn and grow from (Nissen, 2006). Drug courts are able to employ these approaches by using motivational interviewing techniques during assessments, screening, and interactions with juveniles and the drug court team. When treatment plans are created, the drug court team looks at how the juvenile's strengths can be nurtured through individualized comprehensive treatment plans. The judge and the drug court team continually focus on the client's strengths in all steps of the program including during court hearings, case management, and in treatment settings. It is also important that the drug court team ensures that treatment providers and any community partners use strength-based approaches (NDCI, 2003).

The application of these strength based approaches in juvenile drug courts is not always easy (NDCI, 2003). Barton and Butts (2008) conducted an exploratory study of these approaches within the juvenile justice system and found that these approaches are very possible and show positive outcomes for the youths. Juvenile drug courts use strength based approaches continuously through the program to enhance the juveniles' skills and strengths to ultimately provide them with the tools to live drug free and crime free lives (Barton & Butte, 2008; Cooper, 2002; NDCI, 2003; Nissen, 2006). As strength based approaches help juveniles overcome

challenges, reintegrative shaming is a critical element for recognizing the harm done by the crime, and seeking reconciliation and reintegration back into the community (Fulkerson, 2009).

Reintegrative Shaming

Reintegrative shaming theory suggests that the most efficient way to reduce and control crime is through the effective communication of shame (Braithwaite, 1989). Reintegrative shaming states that if a society lacks communication of shame in regards to criminal behavior, then criminal acts are not condemned resulting in high levels of crime and violence. If a society is able to communicate the shame of crime effectively, the society will have less crime and violence. Reintegrative shaming uses effective communication to disapprove of the criminal act, while maintaining respect for the offender. In other words, the offender is not viewed as a bad person or a criminal, but the act he or she committed is condemned as being wrong. After the criminal act has been shamed, efforts are made to reaccept and reintegrate the offender back into the community. This can be done through forgiveness from victims, families, or community members as well as through ceremonies to welcome the offender back into the community (Braithwaite, 1989).

If the shaming is not done in an effective way, it becomes disintegrative shaming or stigmatizing, which can be further detrimental to the offender and increase the likelihood of future criminal behavior (Braithwaite, 1989, 2000). Stigmatization of offenders is a disrespectful type of communication that is unforgiving and suggests that the offender is a bad person. Stigmatization causes an offender to be rejected by society, which leads to a disregard of cultural norms and the laws of society. The rejection of stigmatization increases the appeal of criminal subcultures. Criminal subcultures neutralize the shame of the law-breaking, and provide a culture that accepts, encourages and teaches criminal behavior. The theory suggests that stigmatization,

the rejection and labeling of offenders, may lead to greater violence and crime (Braithwaite, 1989, 2002).

Reintegrative shaming theory brings together many mainstream criminological theories including labeling theory, control theory, opportunity theory, subculture theory, strain theory and differential association theory (Braithwaite, 1989, 2000). Braithwaite (1989) provides a detailed description in his book on how these theories all play a role in reintegrative shaming. For the purpose of this present study, the progressive dynamics of multiple theories will not be discussed in this paper. Instead this study focuses on the overarching concepts of reintegrative shaming as applied to juvenile drug courts.

Reintegrative Shaming and Juvenile Drug Courts

Reintegrative shaming theory has not been thoroughly studied nor applied to drug courts, but the overarching goals of juvenile drug courts and their focus on reintegration back into the society is consistent with elements of the theory (Miethe et al., 2000). Juvenile drug courts demonstrate elements of restorative justice through their procedures, community orientation and the use of reintegrative shaming. Drug courts mirror the theory of reintegrative shaming, as the disapproval of the act, including the crime committed and addiction is made clear, but the offender is respected and reaccepted back into the community upon program completion (Fulkerson, 2009). Drug courts use graduation ceremonies to recognize participants' success of sobriety and reintegrate them back into society. Many drug courts also dismiss or reduce the current criminal charge for graduates, which helps reduce stigmatization in the community as well as increase opportunities such as employment or education. Drug court participants also remain in the community while participating in the program, which increases community and family ties and strengthens relationships, an integral part of reintegrative shaming (Fulkerson,

2009). Braithwaite (2002) believed that stigmatization was unforgiving whereas reintegrative shaming offered grace and forgiveness. Drug courts allow for forgiveness of the crime committed, provides offenders with treatment and tools to overcome their addictions and then reintegrates them back into a community (Fulkerson, 2009; Miethe et al., 2000). Reintegrative shaming theory is found within the juvenile drug court design, processes and goals.

Juvenile drug courts were originally created without a theoretical framework or foundation (Fulkerson, 2009). Nevertheless, the basic principles, goals, and techniques found in restorative justice can help explain the framework of juvenile drug courts and their intended outcomes (Fulkerson, 2009; Menkel-Meadow, 2007; Miethe et al., 2000). The overarching goal is to restore an offender to a drug and crime free life while also restoring justice to the public by creating a safer community (Fulkerson, 2009). Under the umbrella of restorative justice, therapeutic jurisprudence allows the courts to work as an agent to provide treatment to offenders (Hora et al., 1999), strength based approaches use juveniles' strengths to overcome challenges including drug addiction (Weick et al., 1989) and reintegrative shaming allows for a respectful communication of shame while providing forgiveness and re-acceptance back into society (Braithwaite, 1989, 2002, 2000). These components come together within the restorative justice theory and represent essential pieces of the juvenile drug court model. The restorative justice framework provides a theoretical explanation of how juvenile drug courts function.

Juvenile Drug Courts: Are They Effective?

Findings from Meta-Analyses and Systematic Reviews

Until recently, juvenile drug court research had been sparse and little empirical or rigorous research had been conducted (Marlowe, 2010B). Only a handful of meta-analysis and systematic reviews have been done on juvenile drug courts in the United States and Canada.

These studies provide a comprehensive overview of the effects juvenile drug courts have on juveniles. Most studies report juvenile drug courts had little to no effect on participants' recidivism rates and participants usually fared neither better or worse than the comparison groups based on recidivism rates (Mitchell et al., 2012; Shaffer, 2006; Stein et al., 2015; Tanner-Smith, Lipsey, & Wilson, 2016). One research group went as far to say that the results of their study suggest juvenile drug courts may not be an appropriate intervention for the target youth population (Latimer et al., 2006). Aos and colleagues (2006) were the only ones to report juvenile drug courts to be an effective and cost beneficial juvenile intervention. These meta-analyses and systematic reviews show the mixed results and findings in regards to the effectiveness of juvenile drug courts on future recidivism. The results of the most recent meta-analyses will first be presented, followed by a literature review of single and multi-site juvenile drug court evaluations

The most recent meta-analysis of juvenile drug courts was conducted by Tanner-Smith, Lipsey, and Wilson (2016). The inclusion criteria for their study required that studies used a controlled experimental or quasi-experimental design, evaluated a juvenile drug court program, measured recidivism rates or criminal behavior, was conducted in either Canada or the United states and was published after 1989. After conducting a thorough search of existing literature, the researchers found 46 samples which included a total of 8,738 juveniles that matched their search criteria. The researchers noted that a large majority of the studies were published journal articles from the United States and most of the studies were of poor methodological quality and lacked random assignment. In the collection of studies, the researchers found that an overwhelming majority of the participants were white (67%) and males (79%). It was noted that the juvenile drug court groups tended to be made up of lowest risk youths and were more likely to be female

and white, resulting in a possible selection bias of the juvenile drug court group make up. It also raised the issue of the inability to adequately compare male and female outcomes. The included studies had an average maximum follow up time period of 18.5 months. The findings suggested that for general recidivism rates, juvenile drug court participants showed slightly lower recidivism rates, but the analysis was not statistically significant. For drug related recidivism, 12 studies that measured drug related recidivism after the programs were analyzed. Similar to the general recidivism outcomes, drug related recidivism outcomes suggested that although the mean effect size favored juvenile drug court participants, there was no statistical significance. Drug use during program or probation participation was measured in of the collected eight studies. The analysis of these studies suggested that although there was no statistical significance, non-juvenile drug court participants had lower drug use rates than juvenile participating in juvenile drug court. With regards to the limitations of the study, this systematic review of available literature suggests that juvenile drug courts do not reduce or increase general recidivism rates, drug related recidivism or drug use. The study was also unable to gain insight on how individual characteristics, such as gender, influenced recidivism outcomes. The study did state that juvenile drug courts tend to vary on characteristics which may have an impact on how effective that individual drug court is (Tanner-Smith, Lipsey, & Wilson, 2016).

Another recent and comprehensive meta-analysis reviewed 31 studies of juvenile drug courts and looked at comparative recidivism rates of drug court participants and comparison groups (Stein, Homan, & DeBerard, 2015). Within the 31 studies, there were 4,250 juvenile drug court participants and 4,250 juveniles that made up the comparison groups. The study used recent drug court literature from 2004 to 2008 and included both published and unpublished works including evaluation reports and dissertations. It was noted that only two of the studies

used random assignment, while all the others used quasi-experimental designs. For their study, the researchers defined recidivism as a re-arrest, new charge or a new referral. Recidivism rates were evaluated in four different time periods; “(1) pre- to- post- program, (2) pre- to approximately 1 year post-program, (3) 1 year post program only, and (4) 1+ years post program,” (Stein et al., 2015, p. 82). Due to reporting styles, only 23 studies were used to evaluate the recidivism effect sizes for the pre-to–post program time period. Stein and colleagues (2015) used a random effects meta-analysis model to find the effect size of recidivism for this time period. The results found a weighted mean effect size of $p=.07$ for drug courts effect on recidivism rates. For a one-year post program follow up period, 19 studies were used and produced a weighted mean effect size of $p=.11$. The results suggested delinquent behavior decreased during the following year after the program. Seven studies reported ‘long-term’ recidivism rates, which included time periods greater than one year. The mean effect size recidivism rates for long-term studies was $p=.11$.

The overall findings of this comprehensive study suggest that juvenile drug courts had only a modest effect when participants were compared to similar juveniles who went through traditional juvenile court. However, the mean difference between the two groups tends to increase slightly as the follow up times increase, suggesting the need for longer program follow up times. The study also suggested the presence of gender bias within the programs, as they study found that higher proportions of males in treatment courts were associated with lower recidivism rates than males in comparison groups. The authors speculated that these findings don’t support the notion that males do better than females in the courts and that gender bias among these programs might explain for this outcome (Stein et al., 2015).

In 2012, a meta-analytic review of 154 traditional and non-traditional drug courts, including 28 driving while intoxicated courts, 92 adult courts and 34 juvenile courts was conducted (Mitchell et al., 2012). For the purpose of this study, only the juvenile drug court results will be reviewed. Data was analyzed using an inverse variance method. It was noted that a majority of the collected studies were quasi-experimental, had weak methodology and included predominantly male participants. For juvenile drug courts, longest recorded follow up time for recidivism rates was 12 months, and many results included time periods while the individual was still in the program. Results found general recidivism rates of juvenile drug court participants (42.2%) to be statistically significant with means to odds ratio of 1.37. This was analyzed through the assumption of a 50 percent recidivism rate for the control group, suggesting small effects on recidivism. The means to odds ratio for drug court participants dropped to 1.06 when drug related recidivism outcomes were evaluated. This suggests that juvenile drug courts were not effective, or provided a very small effect on drug related recidivism. It was also noted, that the strongest methodological evaluations reported small effect sizes, while weaker evaluations reported larger effect sizes (Mitchell et al., 2012). This difference of produced effect sizes in regards to methodological strength in criminal justice settings has been further documented and tested elsewhere (Weisburd, Lum, & Petrosino, 2001). Overall the results suggest that the juvenile drug courts in the meta-analysis showed small effect sizes on recidivism (Mitchell et al., 2012).

Shaffer (2006) conducted a meta-analysis of 60 drug court outcome evaluations, 18 of which were juvenile drug court outcome evaluations. It should be noted that although Shaffer's (2006) meta-analysis is an unpublished dissertation, her work has been cited in many relevant articles (e.g Latimer et al., 2006; Mitchell et al., 2012; Stein et al., 2015; Sullivan et al., 2014)

and therefore was determined beneficial to this present study. Her meta-analysis used data collected from previous outcome evaluations, as well as information collected through phone interviews and self-administered surveys of the drug court coordinators of the studies included in the meta-analysis. Shaffer (2006) aimed to find the effect sizes using the longest recorded follow up periods presented by the studies. Data analysis reported the mean effect size of juvenile drug courts was 0.5 (95% CI: .01 to .08). The drug court participants had significantly lower recidivism rates (47.5%) when compared to the comparison group (52.5%). Shaffer (2006) cautioned the interpretation of the findings because when the outliers were removed, the confidence interval fell to .00 to .08, suggesting there may be no statistically significant difference in recidivism rates. Shaffer (2006) did not look at the effects of gender on the effect sizes for the juvenile drug courts. She found that females did better in adult courts, but excluded the juvenile drug court samples from the analysis. She did emphasize that future studies should take into consideration the impact of gender on recidivism outcomes for drug courts, including juvenile drug courts. Overall, the results reported a very modest to null effect size of drug courts effects on recidivism (Shaffer, 2006). Other systematic reviews and meta-analyses support Shaffer's (2006) findings, that juvenile drug courts have modest to no effect on recidivism rates (Latimer et al., 2006; Mitchell et al., 2012; Stein et al., 2015).

In the same year, Latimer and colleagues (2006) conducted a large meta-analytic study of drug courts. Their search produced 66 drug court programs, including seven studies of juvenile drug courts. The results of their study found that although adult drug courts were effective at statistically reducing recidivism rates, the juvenile drug courts were not. For juvenile drug courts the produced mean estimated effect size was .06, with a 95 percent confidence interval of -0.12 to 0.24. Because the confidence interval for the juvenile drug courts included zero, no confidence

could be placed on juvenile drug courts ability to reduce recidivism. The study reported that the sample was composed of mostly males, but they did not report on any findings in relation to gender. Small sample size was a limitation for this study, and it was recommended that additional studies look to determine the effectiveness of juvenile drug courts. Nevertheless, Latimer and colleagues (2006) stated that the results of their study suggested that juvenile drug courts may not be suitable for youth offender populations.

To examine the effects of prison alternatives on recidivism rates, Aos and colleagues (2006) conducted a meta-analysis. Focusing on juvenile drug courts, they looked at the results of 15 studies, where recidivism was defined as new convictions or arrests, and the longest recorded time period follow up for each study was used. The results produced a fixed effect model weighted mean effect size was -0.133 ($p=.001$), and for a random effects model weighted mean effect size was -0.089 ($p=.122$). These findings suggest that juvenile drug court participants recidivated less than the comparison groups. The authors stated that juvenile drug courts were cost beneficial and an effective option for policy changes in Washington State (Aos et al., 2006).

The study conducted by Aos and colleagues (2006) was the only meta-analysis that confidently found strong supporting results that juvenile drug courts were effective at reducing recidivism. All other studies found modest to no effect sizes, suggesting that juvenile drug courts may be effective but the effect sizes were too small to make concrete conclusions (Mitchell et al., 2012; Latimer et al., 2006; Shaffer, 2006; Stein et al., 2015; Tanner-Smith, Lipsey, & Wilson, 2016). These studies present a comprehensive look at what is currently known about juvenile drug courts at the national level. Single and multi-site evaluations provide another perspective on the effectiveness of juvenile drug courts and how different courts produce different outcomes.

Findings from Single and Multi-Site Evaluations

Single and multiple site evaluations have been conducted on many different juvenile drug courts across the nation. These types of studies allow for a better understanding of how juvenile drug courts vary and their abilities to produce different effect sizes and results. Most of the evaluations have been quasi-experimental using some type of comparison group and have a wide range of follow up time periods. Evaluations vary greatly in regards to program characteristics, geographic location, sample characteristics and methodology. For the purpose of this present study, evaluations that looked at recidivism rates and outcome evaluations of recidivism rates will be discussed.

Numerous evaluations have been conducted and most have found juvenile drug courts to have a positive effect on reducing recidivism, although the findings were not always significant or without limitations (Anspach et al., 2003; Brewster, 2001; Carey et al., 2006; Harrison et al., 2006; Hickert et al., 2010; Latessa et al., 2002; NPR Research, 2006; Pitts, 2006; Rodriguez & Webb, 2004; Thompson, 2004). The claim that juvenile drug courts can effectively reduce future recidivism is not unanimous, as some studies have found negative or no effects (Cook et al., 2009; Sloan, Smykla, & Rush, 2004; Sullivan et al., 2014). Evaluations that found positive results of juvenile drug court effectiveness will first be discussed, followed by studies that found drug courts to be ineffective at reducing recidivism.

Positive Findings

Program effects have shown to be very effective while participants are actively participating in the drug courts. Brewster (2001) conducted a 12 month study of a juvenile drug court in Chester County, Pennsylvania. A comparison group of 51 similar youths were used to compare recidivism rates of 184 juvenile drug court participants. During the program, juvenile

drug court participants were less likely to have positive drug tests compared to the comparison group. The study also looked at the survival analysis of revocation of 30 females and 149 males to determine any gender differences. There was no difference in the survival patterns of revocation for program participants based on gender, but it is important to notice that the gender was not split up into groups, therefore this just presents a gender analysis, not a gender by group analysis. During the study period, only 25 youths graduated from the drug courts and follow up data was recorded for 15 of them. Due to insufficient follow up time, no statistical analysis could be drawn, but the participants reported no drug use and had obtained stable employment. Brewster (2001) emphasized the need for long-term follow up of juvenile drug court participants to evaluate the long-term effects.

In order to understand the effects of juvenile drug courts both during and after the drug court program, a 24 month evaluation of a juvenile drug court in Harford County, Maryland was conducted (NPR Research, 2006). From the date of drug court entry, drug court graduates had fewer re-arrests and spent fewer days in prison than traditional probation youth. This study looked at both juvenile and adult recidivism records. Non-completers of the drug court had an average of 3.2 arrests during the 24 month study period, compared to 1.3 for graduates and 2.6 for the comparison group. The authors reported that juvenile drug court participation significantly reduced the chances of recidivism and that the juvenile drug court was successful in meeting its goals (NPR Research, 2006). A 12 month evaluation of 105 juvenile drug court participants and 105 similar traditional probation youth in Maine found that overall, juvenile drug court participants had significantly lower recidivism rates (54%) compared to the comparison group (66%) (Anspach et al., 2003). Data was collected for both juvenile and adult recidivism rates. Multivariate analysis showed that the control group was two times more likely

to recidivate. Drug court participants were also found to have less severe offenses when they did recidivate. The evaluation reported with strong confidence that juvenile drug courts were effective in reducing recidivism of program participants (Anspach et al., 2003).

Pitts (2006) also used juvenile and adult recidivism rates to evaluate the impact of New Mexico juvenile drug courts on recidivism. The study used a comparison group (n=61) of traditional probation youth by historically matching on many variables including sex, age, race, gender, criminal backgrounds, substance abuse, and drug court eligibility. The treatment group (n=62) included juveniles who exited the juvenile drug court program, either from termination or graduation between January 1, 2001 to December 21, 2002. Both groups were made up of mostly males (80%, 78%). Criminal history data, including both juvenile and adult recidivism rates were collected in 2004, allowing for a minimum of 16 months of exposure and a maximum of 40 months. Recidivism was defined as a new referral to juvenile courts or a new arrest as an adult. Results of the study found that when juvenile and adult recidivism rates were combined, drug court participants had significantly lower recidivism rates (37.1%) compared to the traditional probation group (55.7%). The study did not look at any findings related to gender. Overall the study found that drug court participants had lower recidivism rates when juvenile and adult recidivism rates were combined (Pitts, 2006).

A study of a Utah drug court found that drug court participants had lower recidivism rates for drug related charges compared to traditional probation youths after a three year follow up, but no difference in regards to non-drug or alcohol related recidivism rates (Harrison et al., 2006). A major limitation of this study is that it did not continue to track recidivism rates of juveniles after they turned 18, and therefore the study experienced a large attrition rate. After one year of follow up, 116 youth remained under the age of 18. By the end of the three year follow up, only 22

youth remained eligible for the study. At the one year follow up, graduates had a 17.8 percent alcohol/drug related recidivism rate, program dropouts had a 43.8 percent rate, and the comparison group had 10.9 percent recidivism rate. At the three year follow up the alcohol/drug related recidivism rates were as follows; graduates (40%), dropouts (75%) and the comparison group (50%). The study shows that the differences between the groups became evident after longer time periods. Drug court participants fared better than drop outs and comparison youth in regards to drug and alcohol related recidivism rates. There were no statistically significant differences between non-alcohol or drug related recidivism rates after three years between the graduates (80%), dropouts (75%) and the comparison group (75%) (Harrison et al., 2006). The results of this evaluation should be taken with caution due to the high attrition rates within the methodological design.

Similar results were found in a more recent evaluation of six different juvenile drug courts in Utah (Hickert et al., 2010). Drug court participants from the largest drug courts (n=622) were matched with participants from a nearby drug and alcohol probation program (n=596). Both adult and juvenile recidivism rates post-program were collected and analyzed for a 30 month follow up period. Recidivism was defined as a new referral as a juvenile or a new arrest as an adult. After the 30 month follow up, 64 percent of drug court participants and 70 percent of the probation participants had recidivated. There was no significant difference between the groups for alcohol and drug related recidivism rates, even after factors such as age, gender and priors were controlled for. For criminal recidivism, the juvenile drug court participants were associated with a lower level of recidivism (30% less) compared to the probation group. The difference remained significant even after controlling for other factors. The study found that juvenile drug court reduced the likelihood of future criminal recidivism in comparison with the probation

group but it did not have any effect of the likelihood of future drug and alcohol offenses. Hickert and colleagues (2010) did report on significant gender differences. The odds ratios showed that male juvenile drug court participants were 1.9 times more likely than female participants be charged with an alcohol or drug related offense after leaving the program. Juvenile drug court males were 2 times more likely than juvenile drug court females to criminally recidivate after leaving the program. When looking at both the comparison group and juvenile drug court group, the study found that males were 2.1 times more likely to criminally recidivate after leaving their programs. The findings of the study suggest that males tend to do worse in regard to both future criminal recidivism and alcohol and drug recidivism. Juvenile drug courts do provide at least minimal protection from future recidivism (Hickert et al., 2010).

Rodriguez and Webb (2004) found positive effects on recidivism rates in their three year evaluation of Maricopa County (AZ) juvenile drug court. The study period was from October 1997 to November 2000 and included 114 juvenile drug court participants and 204 matched comparison youths. The authors reported that juvenile drug court participants were less likely to recidivate, but there was no difference between the amount of positive drug tests for THC. Drug court participants were also more likely to test positive for cocaine use during treatment. These findings were attributed to the possible negative effects of the social environment of drug courts. The amount of monitoring of the youths by the staff may also have attributed to these findings. As the study found that the drug court program had a positive effects on recidivism, the study also found that drug court participants were more likely to test positive for cocaine (Rodriguez & Webb, 2004).

Program evaluations have found that juvenile drug courts can reduce recidivism rates during the program (Brewster, 2001) as well as after program completion (Anspach et al., 2003;

Harrison et al., 2006; Hickert et al., 2010; NPR Research, 2006; Rodriguez & Webb, 2004).

Some studies suggest that there were no effect sizes of drug and alcohol related recidivism rates (Harrison et al., 2006; Hickert et al., 2010), while one study found that drug court participants were more likely to use cocaine throughout the drug court program and equally as likely to test positive for THC (Rodriguez & Webb, 2004). Overall the findings suggest that juvenile drug courts can have some effect size on recidivism rates both during and after juvenile drug court participation (Anspach et al., 2003; Brewster, 2001; Harrison et al., 2006; Hickert et al., 2010; NPR Research, 2006; Rodriguez & Webb, 2004).

Negative Findings

One of the largest national juvenile drug court evaluations discovered that overall, juvenile drug court participants recidivated at higher rates than their comparison groups (Sullivan et al., 2014). Nine juvenile drug courts were used in this study and resembled those of adult courts. The nine courts shared many similar features including eligibility requirements, phases within the program, reward and sanctioning policies, and parental involvement. In order to conduct a quasi-experimental design, the juvenile drug court participants (n=686) were matched on an individual basis with traditional probation youth (n=686). They were matched on several variables including jurisdiction, age, gender, race, risk level, frequency of substance use, offense level, offense type, priors, and gang involvement (see Sullivan et al., 2014, p. 12 for complete list). The average time at risk between both groups varied by four months as drug court participants had a mean time at risk of 26.1 months compared to the control group, 22 months. After the observation period, 60 percent of the drug court participants received a new referral or arrest, compared to 49 percent of the comparison participants (Sullivan et al., 2014). Even when risk level, gender, race, and age were controlled for, drug court participants fared significantly

worse, suggesting the drug court had no effect on reducing recidivism (Sullivan et al., 2014). Further analysis did show that as the youths got older the likelihood of recidivism decreased and females were less likely to recidivate compared to males. Only three out of the nine drug courts participants had lower rates than the regular probation comparison group. The negative effects of these juvenile drug courts could be attributed to the fact that the programs may not have properly assessed the participants' risks levels and need for treatment or adhered to evidence based practices (Sullivan et al., 2014). Program ineffectiveness and non-adherence to evidence based practices were common results when juvenile drug courts were tested using the Evidence Based Correctional Program Checklist-Drug Court (Blair, Sullivan, Lux, Thielo, & Gormsen, 2014). Overall, the findings of the study suggest that drug court participants had higher recidivism rates than their comparison groups, and juvenile drug courts were not an effective intervention (Sullivan et al., 2014).

Sloan, Smykla, and Rush's (2004) retrospective study found that juvenile drug courts produced no effect sizes on recidivism rates. This study looked at drug court participants who were terminated (n=150) from 1996 to 1999 and youth who were terminated from the Adolescent Substance Abuse Program (ASAP, n= 158) from 1994 to 1995. The drug court group was composed of 88.7 percent male participants and males made up of 89.2 percent of the ASAP group. Results found that 61.9 percent of drug court participants were arrested during the 24 month follow and 34.6 percent of the ASAP youth were arrested. This study faced many limitations including notable differences between the two groups and the two programs. The programs differed in length, use of sanctions and rewards, and different monitoring and compliance tactics. The ASAP program lasted 12 weeks and the drug court program lasted 12 months. The drug court participants also tended to be older, had more prior convictions, were

considered to be more serious offenders and had been subjected to a longer intervention. After controlling for these differences through the use of logistic regression, group membership was not significantly related to recidivism, suggesting that juvenile drug court participants were no more likely than the ASAP youth to recidivate. Although group membership was not a significant predictor of future recidivism, gender was a significant predictor. Compared to females in the study, males were 1.24 times more likely to recidivate (Sloan et al., 2004).

These evaluations provide little certainty in regards to the effectiveness of juvenile drug courts. Some suggest juvenile drug courts can be effective at reducing recidivism rates (Anspach et al., 2003; Brewster, 2001; Carey et al., 2006; Harrison et al., 2006; Hickert et al., 2010; NPR Research, 2006; Pitts, 2006; Rodriguez & Webb, 2004), while other studies find juvenile drug courts to be ineffective (Sloan et al., 2004) and possibly increase future recidivism (Sullivan et al., 2014). The use of ineffective or non-evidence based practices within the juvenile drug courts could be a contributor to the lack of effect sizes for programs (Marlowe, 2010B; Sullivan et al., 2014). The majority of findings suggest that female participants tend to have the lowest recidivism rates (Brewster 2001; Hickert et al., 2010; Sloan et al., 2004; Sullivan et al., 2014). Overall, the research provides very mixed findings in regards to effectiveness of juvenile drug court's and their ability to reduce future recidivism. In addition to the mixed findings of current juvenile drug court research, one of the most common limitations is the short follow up times (Belenko, 1998, 2001). Few studies have attempted to look at long term follow up times.

Long-term Studies of Juvenile Drug Courts

Not only has research on juvenile drug courts resulted in mixed findings, very few studies have looked at long-term effects. Belenko (1998, 2001) stated there is a lack of appropriate long-term follow up periods in drug court literature to understand long-term impacts (Belenko &

Dembo, 2003). Within their meta-analysis Stein et al., (2015) reported that many studies stop tracking recidivism rates of individuals once they turn 18, which was a large methodological limitation in the Harrison et al., (2006) study. These issues are problematic because previous studies have shown that effect sizes of drug courts increase over greater lengths of time (Latimer et al., 2006; Lowenkamp et al., 2005) and the likelihood of recidivism decreases with age (Harrison et al., 2006; Sullivan et al., 2014). Thompson (2004) and Cook, Watson, and Stageberg (2009) conducted studies with long term follow up periods that looked at how juvenile drug courts effect juvenile and adult recidivism rates. Thompson (2004) included a four year follow up time period after program completion. Cook et al., (2009) included a four and a half year time period including the time in the program. Both studies found different results, reinforcing the need for long-term follow up periods to understand what effects, if any, juvenile drug courts have on adult recidivism rates. The long-term impacts of drug courts on recidivism currently remain unknown (Mitchell et al., 2012).

Thompson (2004) conducted a four year follow up study to evaluate the effects juvenile drug courts had on adult recidivism rates. Thompson (2004) emphasized the need for long-term follow ups to assess the effectiveness of juvenile drug courts into adulthood. Using data from two juvenile drug courts in North Dakota, the Northeast Central district (NEC) and the East Central district (EC), Thompson (2004) compared recidivism rates of juvenile drug court graduates (n=44), non-completers (n=46) and a similar comparison group (n=43). By July 31, 2004 the average age of the youths in the study was 19.5 years. Four different measures of adult recidivism were used in this study, (1) any felony conviction, (2) any substance use charge, (3) any conviction of a class A misdemeanor and (4) any arrest that resulted in a class A misdemeanor charge or higher. Recidivism rates for the EC graduates and non-completers were

higher than the comparison group on all recidivism measures. The comparison group had significantly lower rates of substance use violations (21%) compared to the EC drug court graduate (50%) and non-completer group (48%). The NEC court, showed very different results as the graduates had overall lower recidivism rates, and the non-completers had the highest recidivism rates. The non-completer group had a moderately significant ($p < .10$) higher rate of arrests that resulted in a class A misdemeanor or higher (52%) compared to the graduates (21%) and the comparison group (44%). Thompson (2004) also found that gender was a statistically significant correlate, as males were significantly more likely to have a Class A Misdemeanor conviction in adulthood compared to females. Overall, Thompson (2004) found that NEC graduates were the most successful group in adulthood, which he attributed to the length of the program they participated in. The NEC graduates participated in the drug court for an average of 11.1 months, compared to 7.8 months for the EC graduates. The overall findings suggest that drug courts can be effective at reducing adult recidivism, but program characteristics such as program length are very influential (Thompson, 2004).

Cook, Watson, and Stageberg (2009) conducted an outcome evaluation study of Iowa's adult and juvenile drug courts in 2003. The statewide study looked at six adult drug courts and three juvenile drug courts. Only the findings for the juvenile drug courts will be discussed in this section. This quasi-experimental study matched the juvenile drug court participants to a comparison group using demographic and criminal offense variables. There were also two separate types of juvenile drug court models used within the study; (1) a community panel court and (2) a judge led court. The judge led court resembled what most juvenile courts look like, while the community panel model was led by community members and volunteers. The total sample size of the treatment group included 105 participants, 66 from the community model, 39

from the judge model, and 104 youth made up the matched comparison group. The follow up time period included 4.5 years, including the time spent in the program. Recidivism rates were tracked in both juvenile and adult criminal justice record systems. After data collection and analysis, the authors reported no differences in recidivism rates between groups as drug court participants fared no better than the comparison group. After the first year, 34.6 percent of participants that graduated had recidivated, compared to 32.7 percent of the comparison group. At the end of the 4.5 years, participant non-completers had the highest recidivism rate (77.6%) followed by the graduates (73.2%) and the comparison group had the lowest rate (72.1%). When the authors looked at the differences between the model types, the community panel model graduates had higher recidivism rates (76.9%) compared to the non-completers (75%). In the judge model, the non-completers did much worse than the graduates as they had a recidivism rate of 88.9 percent, and the graduates had a 73.3 percent recidivism rate. Although reported differences between the models can help explain some of the outcome differences between group outcomes, the overall findings show that there was no statistically significant difference in recidivism rates between juveniles who participated in a juvenile drug court intervention and those who did not (Cook et al., 2009).

Understanding the long-term effects produced by juvenile drug courts is a critical piece of evaluating juvenile drug courts' place within juvenile corrections. There is lack of studies that have looked at this phenomenon and further research is needed (Belenko, 1998, 2001; Belenko & Dembo, 2003; Latimer et al., 2006; Mitchell et al., 2012; Thompson, 2004). Thompson (2004) and Cook et al., (2009) conducted studies that have some of the longest follow up times for recidivism rates in current literature. They produced very different findings, as Thompson's (2004) study found that one drug court group had much lower recidivism rates, while drug court

participants from another district had higher recidivism rates than the comparison groups. Cook and colleagues (2009) found no significant differences between recidivism rates of drug court participants and the comparison group. Such different outcomes emphasize the need for further research and understanding of the long-term effects of juvenile drug courts. Currently the long-term effects of juvenile drug courts remain unknown (Mitchell et al., 2012), and attention needs to be paid to this evident gap in the literature.

CHAPTER 3: THE PRESENT STUDY

In order to explore the long-term effects North Dakota's juvenile drug courts had on adult recidivism, this study used a quasi-experimental post treatment comparison design (Campbell & Stanley, 1963). The study used secondary data from North Dakota's juvenile court system to compare recidivism rates of individuals who participated in juvenile drug court and those who were deemed eligible for juvenile drug court but went through the traditional probation instead. The sample used in this study was collected by Dr. Kevin Thompson in previous studies and included juveniles that were in North Dakota's juvenile justice system between 2000 and 2007. All data and methods of data collection used in this study were approved by the North Dakota State University Institutional Review Board.

North Dakota Juvenile Drug Courts

This present study included participants residing in four juvenile drug court districts. The Northeast Central (NC) juvenile drug court in Grand Forks and the East Central (EC) juvenile drug court in Fargo, both began operation in the year 2000. The South Central (SC) court in Bismarck began operation in 2002 and later the Northwest (NW) juvenile drug court opened in Minot in 2007. Although North Dakota has expanded the use of juvenile drug courts to other cities in the state, only the four previously mentioned sites will be focused on in this study. To provide a greater understanding of how North Dakota's juvenile drug courts are organized, managed, and operated a summary of North Dakota's juvenile drug court manual from 2007 is presented.

North Dakota's juvenile drug court state that their mission is, "to reduce juvenile crime and substance abuse by referring youth to a court-managed treatment program which holds them accountable and emphasizes personal responsibility," (North Dakota Juvenile Court System

[NDJCS], 2007, p. 5). North Dakota's juvenile drug courts are operated as a post-petition/post-adjudication program, where a juvenile can be referred to the program after admitting to the offense. Referral into North Dakota's juvenile drug courts can be made from multiple sources including defense counsel, treatment providers, state's attorney, or juvenile court professionals. After being referred, juveniles are then screened to determine if they meet the eligibility requirements for the juvenile drug court (NDJCS, 2007).

Eligibility requirements for North Dakota juvenile drug courts are as follows: (1) must be between 13 and 17 years old, (2) no past or present charges of either selling or manufacturing illicit substances, (3) the juvenile must have a diagnosed substance abuse problem, (4) the juvenile must not have any history of violent felony convictions, (5) they cannot have previously been terminated from a juvenile drug court and, (6) the juvenile must admit to committing their current offense. These eligibility requirements act as strong guidelines, but it is noted that the juvenile drug court team has some flexibility on deciding who is eligible given case specific circumstances. North Dakota's juvenile drug court teams are made up of a judge, a juvenile court officer, a local drug court coordinator, the defense counsel, the state's attorney, treatment providers, school representatives, and law enforcement (NDJCS, 2007).

Once a juvenile is accepted into the program the juvenile drug court team creates an accountability program plan which is an individualized treatment plan designed to meet the specific needs of the juvenile. The program plan includes items in addition to probation agreements such as school attendance, drug/alcohol treatment, community service, counseling services, or restitution. Each drug court site has variations in their program plans. These program plans may vary in the program stages and how long juveniles spend in each stage. Although there are some differences between sites, the sites share the same basic program policies. These

policies include frequent court review hearings, mandatory treatment, alcohol and drug testing, contact with a probation officer, parental involvement, community service, electronic tracking, and school achievement requirements. The drug court programs last a minimum of nine months (NDJCS, 2007).

Throughout North Dakota's juvenile drug court programs, participant progress is continually reviewed by the drug court team. The judge uses a sanction and reward method to encourage positive progress and discourage misbehavior or violations of the program rules. Sanctions can include additional requirements such as more community service hours, increased drug testing, or even termination from the program. Termination from the program results from any new violent or substance related felony offense, continued use of substances, non-adherence to treatment, and continuous non-compliance with probation and program regulations. Incentives can include anything from praise and recognition, material goods such as movie tickets, or a reduction in mandatory requirements. If a juvenile successfully completes their program plan, they graduate and receive a celebratory ceremony in court. The ceremony allows for all the drug court team and the juvenile's family to celebrate and acknowledge the juvenile's success. Six months after graduation, the judge can decide to dismiss the juvenile's current offense. If the individual remains offense free for two years, they can request to have their entire juvenile criminal record dismissed (NDJCS, 2007). This description of the North Dakota's juvenile drug courts should allow for a better idea of how these juvenile drug courts work. It is important to remember that juvenile drug courts vary and North Dakota's juvenile drug courts may not be representative of all other juvenile drug courts in the country.

Methods

Participants

Participants in this study included juveniles who were involved in North Dakota's juvenile justice system between 2000 and 2007. Participant data included a total of 329 participants. There were 249 individuals who participated in the juvenile drug court program during that time period. Of those 249 individuals, 124 successfully graduated from juvenile drug court and 125 were terminated and did not complete the program. The comparison group was comprised of 80 individuals who met the drug court eligibility requirements but did not participate in juvenile drug court. The reasons these individuals did not participate in juvenile drug court included lack of interest, lack of parental participation, or geographic restrictions that inhibited them from being able to attend the juvenile drug court. Of the 329 juveniles, 67.5 percent were male and 32.5 percent were female. A large majority of the juveniles were white (78.2%), followed by Native American (20.3%), Hispanic (0.9%), and other ethnicities (0.6%). As of January 2017, the average age of the study sample was just under 30 years old which allowed for an average 12 year follow up time since the individuals turned 18.

Due to the limitations of working with secondary data, random assignment was not feasible. The groups were matched to closely resemble each other, as the comparison group was comprised of individuals who met all the eligibility requirements to be a part of juvenile drug court but did not participate. Therefore, the groups should share similar characteristics. This study used statistical controls to control for any differences between groups.

Measurement

The chief independent variable in this study was juvenile drug court participation. Participation in juvenile drug court acted as the treatment component for this study. Membership in each group was coded with the juvenile drug court group being the reference group.

Within the juvenile drug court participation group, there were 124 individuals who graduated from the program and 125 individuals who did not graduate. Non-completion of the juvenile drug court program could be due to a variety of reasons including misconduct, violation of program rules, dropping out of the program, or moving. As the juvenile drug court participants acted as the treatment group, the study also looked at recidivism outcomes for the graduates and the non-graduates as a subgroup. To evaluate the graduates and the non-graduates within the juvenile drug court participation group, an additional dummy variable was created to determine which individuals in the drug court group had graduated and which ones did not.

The dependent variable for this study was adult recidivism. For the purpose of this study, recidivism was defined as an adult arrest or conviction of a misdemeanor or higher criminal offense. This study did not include traffic violations or fish and wildlife violations. This study also included two sub-measures of convictions, substance related convictions and conviction of a violent offense. Substance related convictions included any conviction that was related to the consumption, transportation, selling or possession of a substance. It should be noted that the charge of *minor in possession* was included in this measure. Violent convictions included any convictions related to a violent offense including assault, abuse, robbery, disorderly conduct, harassment or terrorizing.

Two separate measures were created for the dependent variables. First a binary measure was created to assess whether an individual had at least one arrest or at least one conviction. For

example, if an individual had at least one arrest as an adult, they would be coded as 1 for that variable. If they had no adult arrests then the variable would be coded as 0. This was done for all measures of recidivism (arrests and convictions). This study also examined the frequency of offending within the sample. In order to measure the frequency of adult recidivism, the number of adult arrests and convictions were recorded.

Data Collection

All adult criminal records were collected through online criminal record databases from the time that participants turned 18 through the year 2015. The year 2015 was chosen to ensure that all criminal cases had been closed and a verdict had been reached. Both North Dakota and Minnesota have open public criminal records. Using these sources, information on the participant's criminal records were collected. All criminal misdemeanor A offenses and higher were recorded. While there was the possibility that some of the individuals had moved and no longer resided in North Dakota or Minnesota, the assumption was that the rate at which individuals moved out of each state was be relatively equal for both groups. This is a limitation of the study and will be discussed in more detail in the limitations section.

Research Questions

Using the methods of data collection mentioned above, the study attempted to answer the following research questions: (1) Does juvenile drug court participation affect the likelihood and frequency of adulthood arrests? (2) Does juvenile drug court participation affect the likelihood and frequency of adulthood convictions? (3) Does gender impact the recidivism outcomes for the juvenile drug court group and the comparison group? (4) Does graduation from juvenile drug court have any effect on adult recidivism in comparisons to non-completers of juvenile drug court?

Analysis

Following the collection of data, a chi-square test was used to assess bivariate differences in recidivism between the groups. Logistic regression analysis was then employed to determine the log odds of binary recidivism. Linear regression was used to assess the frequency of recidivism. As previously stated, statistical controls were used to assess any pre-existing differences between the groups. All analysis, findings and interpretations of the results are fully reported and discussed in the following sections of this study.

CHAPTER 4: RESULTS

Sample Characteristics

The descriptive statistics of the overall sample are first examined followed by a comparison of the juvenile drug court (JDC) group and the comparison group. A summary of the sample characteristics can be found below in Table 1. There was a total of 329 individuals in this study, 249 individuals made up the juvenile drug court group and 80 individuals made up the comparison group. There were about twice as many males (n=222) compared to females (n=107) in the sample. Thirty-eight percent of the sample was from the EC region, 33.1 percent were from the NEC region, 27.4 percent were from the SC region and only 1.5 percent were from the NW region. As of January 18th, 2017, the average age of the sample was 29.97 years old. There was a total of five missing birthdates. In five other cases, the exact date of birth was not found, but the year the individual was born was determined using the public criminal records. In these five cases, their date of birth was coded as January 1st followed by the year they were born. The ethnic makeup of the sample was mostly white individuals (78.2%) while 21.8 percent of the sample represented minority groups including Native Americans, Hispanics and other groups. There were 13 cases that had no data on the individual's ethnicity.

Table 1

Descriptive Statistics

	Total Sample	JDC Group	Comparison Group
N	329	249	80
Gender			
Male	222 (67.50%)	173 (69.5%)	49 (61.3%)
Female	107 (32.50%)	76 (30.5%)	31 (38.8%)
Ethnicity			
White	247 (78.20%)	186 (77.2%)	61 (81.3%)
Minority	69 (21.80%)	55 (22.8%)	14 (18.7%)
Drug Court Site			
EC	125 (38%)	96 (38.6%)	29 (36.3%)
NEC	109 (33.10%)	94 (37.8%)	15 (18.8%)
SC	90 (27.40%)	54 (21.7%)	36 (45%)
NW	5 (1.50%)	5 (2%)	0 (0%)
1st Drug of Choice			
Marijuana	97 (48.70%)	75 (50%)	22 (44.9%)
Alcohol	93 (48.70%)	68 (45.3%)	25 (51%)
Meth	7 (3.50%)	5 (3.3%)	2 (4.1%)
Cocaine	2 (1%)	2 (1.3%)	0 (0%)
Mental Health Diagnosis			
Positive diagnosis	113 (55.90%)	94 (56.6%)	19 (52.8%)
No positive diagnosis	89 (44.10%)	72 (43.4%)	17 (47.2%)
Family Living Situation			
Both parents	109 (58.20%)	115 (57.5%)	38 (60.3%)
Single parent	153 (58.20%)	84 (42%)	25 (39.7%)
Blended family	1 (0.40%)	1 (0.5%)	0 (0%)

Comparison of Group Characteristics

The juvenile drug court group included 249 individuals and the comparison group was made up of 80 individuals, as seen in Table 2. The average age of the former juvenile drug court participants as of January 18, 2017 was 29.58 years with a standard deviation (SD) of 2.43 years. The comparison group was slightly older than the drug court group with a mean age of 31.35 years (SD=2.22). Table 3 showed that this age difference was a significantly different between the groups, as the comparison group was older by about 1.77 years. The juvenile drug court group was 69.5 percent male and 30.5 percent female, while the comparison group was comprised of 61.3 percent males and 38.8 percent females. The results of the chi-squared tests (as seen in Table 2) showed that there were no significant difference for gender between the two groups. Within the drug court group, most individuals identified as being white (77.2%) while the rest of the group (22.8%) identified as belonging to an ethnic minority group. Most of the comparison group (81.3%) identified as being white, while 18.7 percent belonged to a minority ethnic group. There was no statistically significant difference between these groups in regards to ethnicity according to the chi-squared test. A large portion of juveniles in the drug court group attended juvenile drug court at the EC court (38.6%) and NEC court (37.8%). Twenty two percent of the juveniles attended the SC court and 2 percent attended the NW court. For the comparison group, 45 percent of the comparison group was from the SC region, followed by the EC region (36.3%) and the NEC region (18.8%). There were no individuals in the comparison group from the NW region. The EC and NEC juvenile drug courts were the first drugs courts to commence operation in North Dakota while the NW court was the most recent to begin operation. Therefore, this dispersion of cases from the different sites seems logical based on the establishment of the juvenile drug courts and the ability to gather data from each site. The

chi-squared results did find that there was a statistically significant difference between the groups based on the different site locations. Although this was significant, due to the nature of the study, the site locations were not a part of the analysis, but acted more as demographic factors.

Regarding the juveniles' first drug of choice, the juvenile drug court group reported marijuana as their first choice (50%), followed by alcohol (45.3%), methamphetamine (3.3%) and cocaine (1.3%). For first drug of choice, there was only information on about half of the comparison group (n=49). Of those 49 individuals, alcohol was the most frequently reported drug of choice (51%), closely followed by marijuana (44.9%). Only 4.1 percent reported methamphetamine as their drug of choice and there was no report of cocaine being a drug of choice for the comparison group. For mental health diagnoses, there was only information on 166 of the juvenile drug court participants. Of those 166 juveniles, 56.6 percent of them were positively diagnosed with a mental health disorder. There was only mental health information on 36 of the comparison group individuals, and about half of those individuals (52.8%) were positively diagnosed with a mental health disorder. There was information on family living situation for 200 of the juvenile drug court participants. Of those juveniles, a majority of them reported living with one parent (57.5%) followed by living with both parents (42%) and only one juvenile reported living in a blended family (0.5%). Information on family living situation was collected for 63 juveniles in the comparison group. Of those individuals, 60.3 percent reported living with one parent and 39.7 percent reported living with both parents. The chi-square results showed that there was no difference between groups regarding their first drug of choice, positive mental diagnoses and living situations.

Table 2

Descriptive Statistics by Group

Variable	JDC	Comparison Group	Pearson Chi-Square Value	df	Asymptotic Significance (2-sided)
Gender			1.868	1	0.172
Male	173 (69.5%)	49 (61.3%)			
Female	76 (30.5%)	31 (38.8%)			
Ethnicity			0.579	1	0.447
White	186 (77.2%)	61 (81.3%)			
Minority	55 (22.8%)	14 (18.7%)			
Drug Court Site			20.319	3	0.000**
EC	96 (38.6%)	29 (36.3%)			
NEC	94 (37.8%)	15 (18.8%)			
SC	54 (21.7%)	36 (45%)			
NW	5 (2%)	0 (0%)			
1st Drug of Choice			1.165	3	0.761
Marijuana	75 (50%)	22 (44.9%)			
Alcohol	68 (45.3%)	25 (51%)			
Meth	5 (3.3%)	2 (4.1%)			
Cocaine	2 (1.3%)	0 (0%)			
Mental Health Diagnosis			0.178	1	0.673
Positive diagnosis	94 (56.6%)	19 (52.8%)			
No positive diagnosis	72 (43.4%)	17 (47.2%)			
Family Living Situation			0.442	2	0.802
Both parents	115 (57.5%)	38 (60.3%)			
Single parent	84 (42%)	25 (39.7%)			
Blended family	1 (0.5%)	0 (0%)			

*p<.10, **p<.05

Table 3

Independent Samples T-Test: Age Today

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval	
									Lower	Upper
Age	Equal Var.	1.447	0.23	-5.6	320	.000**	-1.76708	0.31555	-2.3879	-1.14626
	Unequal Var.		-5.879	129.562	129.562	0	-1.76708	0.30059	-2.36178	-1.17238

*p<.10, **p<.05

Characteristic Differences Between Drug Court Graduates and Non-completers

Within the juvenile drug court group, this study aimed to examine any differences in recidivism outcomes between individuals who graduated from the juvenile drug court program and those who did not. Before any analysis could be run, it was necessary to determine if there were any significant differences between the graduate group and the non-completer group. Table 4 shows the descriptive statistics for these groups and the chi-squared results. The graduate group had a total of 124 individuals and the non-completer group was comprised of 125 individuals. The average age of the graduate group as of January 18, 2017 was 29.66 years old. The average age of the non-completer group was 29.49 years old. Table 5 shows that the graduate group and the non-completer group were not significantly different based on age. The graduate group had a greater majority of males (63.7%) compared to females (36.3%). The non-completer group was comprised of 75.2 percent males and 24.8 percent females. The chi-square test showed that gender was significantly different between these groups. For ethnicity, most of the graduate group identified as white (79%) and most of the non-completer group identified as being white (75.2%). In regards to ethnicity, there was not a statistically significant difference between the groups. For the graduate group, 35.5 percent graduated from the EC site, 38.7 percent graduated from the NEC site, 23.4 percent graduated from the SC site and only 2.4

percent graduated from the NW site. For the non-completer group 41.6 percent attended the EC site, 36.8 percent attended the NEC site, 20 percent attended the SC site and only 1.6 percent attended the NW site. There was no significant difference between these groups regarding the drug court location they attended.

The juveniles' drugs of choice were similar for the graduate and comparison group. For the graduate group, information on first drug of choice was only available for about 60 percent (n=76) of the graduate group. Of those 76 graduates, marijuana was the most common drug of choice (48.7%) followed closely by alcohol (47.04%), then methamphetamine (3.9%). No participant reported cocaine as their first drug of choice. For the non-completer group, there was information about drug of choice for about 59 percent (n=74) of the group. Marijuana was the most common drug of choice (51.4%), then alcohol (43.2%), followed by methamphetamine (2.7%) and cocaine (2.7%). There were no significant differences for first drug of choice between groups. For mental health diagnosis, there was missing data for each group. There was mental health data for 72 percent (n=89) of the graduate group and 62 percent (n=77) of the non-completer group. For the graduate group about half (50.6%) had been positively diagnosed for a mental health disorder. Within the non-completer group, 63.6 percent had been positively diagnosed with a mental health disorder. The results of the chi-square tests showed that there was a moderately significant difference in regards to positive mental health diagnoses between groups. It is important to remember though that this measure had missing data, therefore the moderately significant difference should be interpreted with caution. The last demographic measure in this study was family living situation. Similar to the last couple measures, there was missing data for both groups. For the graduate group, there was data on family living for about 84 percent (n=104) of the sample. Of these 104 individuals, 51 percent reported living with both

parents and 49 percent reported living with one parent. For the non-completer group, there was data for about 76 percent (n=95) of the group. Of these 95 individuals, 64.6 percent reported living with both parents, 34.4 percent reported living with one parent, and one percent reported living in a blended family. The chi-square results showed that there was a moderately significant difference between groups based on family living situation. Due to missing data, this should also be interpreted with caution. Apart from gender, which was the only difference between groups that was significant at the alpha .05 significance level, the graduate group and the non-completer group were quite similar to each other.

Table 4

Group Comparison of Descriptive Statistics with Chi-square Results

Variable	Graduates	Non-completers	Pearson Chi-Square Value	df	Asymptotic Significance (2-sided)
Gender			3.876	1	0.049**
Male	79 (63.7%)	94 (75.2%)			
Female	45 (36.3%)	31 (24.8%)			
Ethnicity			0.498	1	0.48
White	98 (79%)	88 (75.2%)			
Minority	26 (21%)	29 (24.8%)			
Drug Court Site			1.202	3	0.753
EC	44 (35.5%)	52 (41.6%)			
NEC	48 (38.7%)	46 (36.8%)			
SC	29 (23.4%)	25 (20%)			
NW	3 (2.4%)	2 (1.6%)			
1st Drug of Choice			2.422	3	0.489
Marijuana	37 (48.7%)	38 (51.4%)			
Alcohol	36 (47.0%)	32 (43.2%)			
Meth	3 (3.9%)	2 (2.7%)			
Cocaine	0 (0%)	2 (2.7%)			
Mental Health Diagnosis			2.973	1	.090*
Positive diagnosis	45 (50.6%)	49 (63.6%)			
No positive diagnosis	44 (49.4%)	28 (36.4%)			
Family Living Situation			5.25	2	0.072*
Both parents	53 (51%)	62 (64.6%)			
Single parent	51 (49%)	33 (34.4%)			
Blended family	0 (0%)	1 (1%)			

*p<.10, **p<.05

Table 5

Independent Samples T-Test: Age today- Graduates vs. Non-completers

		F	Sig	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval	
									Lower	Upper
Age	Equal Var.	0.877	0.35	0.551	246	0.582	0.17021	0.30882	-0.43806	0.77848
	Unequal Var.			0.551	245.491	0.582	0.17021	0.30882	-0.43806	0.77848

*p<.10, **p<.05

Statistical Controls

After the differences between the groups were examined, it was determined that three variables should be statistically controlled for in this analyses. Age was statistically different between the groups therefore, it was controlled for in the analysis. Due to past literature regarding gender and juvenile drug courts (Hickert et al., 2010; Sloan, Smykla, & Rush, 2004; Sullivan et al., 2014; Thompson, 2004), gender was also statistically controlled for. The last variable that was controlled for was ethnicity. Although there were no statistically significant differences between the groups in regards to ethnicity, past literature suggests that ethnicity is significantly associated with recidivism (Sloan, Smukla & Rush, 2004; Stein, Homan & DeBerard, 2015; Sullivan et al., 2014). The original data included the following ethnicities: white, Native American, Hispanic, African American and other. For this present study, a new binary variable was created. White participants were coded as 1 and other ethnicities were combined to create a group variable composed of minority races (coded as 2). The author is aware that all ethnicities are different and combining the minority ethnicities into one group takes away from potential differences between individuals of different ethnicities. But due to the

small sample size, there was not a lot of diversity. Due to this limitation, ethnicity was made into a binary variable. For this study age, gender, and ethnicity were statistically controlled for.

Results

Group Differences

First the statistics of the overall sample recidivism outcomes are examined followed by a breakdown of recidivism outcomes by group. As shown in Table 6, 73.3 percent (n=241) of the whole sample had at least one adult arrest and 71.7 percent (n=236) had at least one adult conviction. Over half of the sample, 66.3 percent (n=218) had at least one substance related conviction. For violent related convictions, 30.1 percent (n=99) of the group sample had at least one violent conviction. For total number of adult arrests, the mean number of arrests was 5.83 with a standard deviation of 7.01 arrests. The overall group had a mean of 5.14 total convictions with a standard deviation of 6.37 convictions. The group had a mean of 2.76 (SD=3.45) total number of substance related convictions and a mean of 0.62 for violent convictions (SD=1.6).

Table 6

Group Recidivism Outcomes

Binary Measures	Yes	No		
Been Arrested	241 (73.3%)	8 (26.7%)		
Been Convicted	236 (71.7%)	13 (28.3%)		
Been Convicted of a Sub. Related Offense	218 (66.3%)	31 (33.7%)		
Been Convicted of a Violent Offense	99 (30.1%)	150 (69.9%)		
Frequency Measures	N	Mean	SD	
Total Arrests	241	5.83	7.01	
Total Convictions	236	5.14	6.37	
Total Sub. Convictions	218	2.76	3.45	
Total Violent Convictions	99	0.62	1.60	

Table 7 shows the results for the recidivism binary outcome measures for each group. For the juvenile drug court group, 74.7 percent (n=186) of the group had been arrested at least once

and 68.8 percent (n=55) of the comparison group and been arrested at least once. Of the juvenile drug court group, 73.5 percent (n=183) had at least one adult criminal conviction while 66.3 percent (n=53) of the comparison group had at least one criminal conviction. For substance related convictions, over half of the drug court individuals (68.7%, n=171) and the comparison group individuals (58.8%, n=47) had been convicted at least once. Within the juvenile drug court group, 32.5 percent (n=81) of the participants had at least one conviction for a violent offense. The comparison group had a slightly lower percentage of individuals with a violent conviction (22.5%, n=18). According to the chi-square results, there were no statistically significant differences between the two groups on any of the binary measure variables. Violent convictions was the only measure that approached significant at the alpha .05 significance level between groups (p=.089).

Table 8 shows the results for the frequency of recidivism measure outcomes and the results of the independent sample t-test comparing the outcome measures for each group. Except for violent convictions, the group's outcomes were not significantly different. The juvenile drug court group had an overall higher frequency of total arrests with a group mean of 6.53 arrests (SD= 7.50) compared to the comparison group who had a mean of 3.66 total adult arrests (SD= 4.62). The drug court group averaged a total of 5.80 convictions per person (SD= 6.84). The comparison group averaged 3.09 total convictions (SD=4.03). For the total number of substance related convictions, the drug court group had a mean of 3.05 convictions (SD=3.56) and the comparison group had a mean of 1.85 convictions (SD=2.90). Violent related convictions had the lowest mean convictions for both groups. The drug court group had a mean of 0.70 for total violent convictions (SD= 1.77) compared to the comparison group who had a mean of .38 convictions (SD=.83).

Table 7

Group Comparison of Binary Outcome Measures with Chi-square Results

Recidivism Measure	JDC	Comparison Group	Pearson Chi-Square Value	df	Asymptotic Significance (2-sided)
Been Arrested			1.094	1	0.296
Yes	186 (74.7%)	55 (68.8%)			
No	63 (25.3%)	25 (31.3%)			
Been Convicted			1.567	1	0.211
Yes	183 (73.5%)	53 (66.3%)			
No	66 (26.5%)	27 (33.8%)			
Been Convicted of a Substance Related Offense			2.668	1	0.102
Yes	171 (68.7%)	47 (58.8%)			
No	78 (31.3%)	33 (41.3%)			
Been Convicted of a Violent Offense			2.896	1	0.089*
Yes	81 (32.5%)	18 (22.5%)			
No	168 (67.5%)	62 (77.5%)			

*p<.10, **p<.05

Table 8

Frequency of Recidivism and Independent Samples T-Test: Group Comparison

	Mean	N	Std. Deviation	t	Sig. (2-tailed)	95% Confidence Interval	
						Lower	Upper
Total Number of Arrests				3.228	0.001**	1.12006	4.61518
JDC	6.53	249	7.50				
Comparison Group	3.66	80	4.62				
Total Number of Convictions				3.362	0.001**	1.12497	4.29842
JDC	5.80	249	6.84				
Comparison Group	3.09	80	4.03				
Total Substance Related Convictions				2.741	0.006**	0.3394	2.06502
JDC	3.05	249	3.56				
Comparison Group	1.85	80	2.90				
Total Violent Convictions				1.577	0.116	-0.08024	0.72783
JDC	0.70	249	1.77				
Comparison Group	0.38	80	0.83				

*p<.10, **p<.05

Binary Logistic Regression Results

A series of logistic regression tests were performed in SPSS to examine the log odds of recidivism. For these tests, the binary measures of recidivism were used. Logistic regression equations were run for the following recidivism measures: arrest, convictions, substance related convictions, and violent convictions. For these tests gender, ethnicity, and current age were controlled for in step one. In step two, the binary group variable (JDC vs. comparison group) was entered.

To determine the log odds of arrests, binary logistic regression was used. In step one age, gender, and ethnicity were entered. For this equation, gender was significant in model one with males recording a higher log odds of arrest likelihood. The group variable (JDC vs. comparison group) was then added in step two of the equation. The results of the logistic regression showed that the coefficient was positive ($B=0.03$) which indicated a higher rate of arrests for the comparison group, but the coefficient was not statistically significant ($p=0.90$). There were no significant differences between the juvenile drug court group and the comparison group on adult arrest recidivism. This suggested that the adults from the juvenile drug court group were no more likely to be arrested than the comparison group.

Throughout the data collection processes, multiple charges against the study participants had been dropped or dismissed. Therefore, there may be a difference between groups on the likelihood of individuals having their cases dismissed or be convicted. Again age, gender, and ethnicity were entered first into the equation. Age and ethnicity were not statistically significant, but gender was moderately significant in model one. In the second step, the grouping variable (JDC vs. comparison group) was added. The coefficient was negative ($B=-.03$) which suggested that the juvenile drug court group had a higher likelihood of conviction but the coefficient was

not statistically significant ($p=.91$). The results found that there were no statistically significant differences the likelihood of convictions between the groups.

Substance related convictions were of interest because juveniles were referred to juvenile drug court in order to combat further substance use. Therefore, if juvenile drug court participation had any effect on substance usage, it would most likely be seen in the substance related conviction measure. A logistic regression equation was run to determine the log odds of being convicted of at least one substance related offense. In step one, age, gender, and ethnicity were all controlled for. None of these variables were significant at this step. Step two included the addition of the group variable (JDC vs. comparison group). The results of the logistic regression showed a negative coefficient ($B=-.20$) but it was not statistically significant ($p=.50$). This indicated that group membership was not a significant predictor of substance related convictions. These results revealed that the juvenile drug court had little effect on reducing the overall substance usage of the juvenile drug court participants.

A final logistic equation examined the log odds of being convicted for a violent offense. Age, gender, and ethnicity were variables controlled for in step one. Both ethnicity and gender were statistically significant at this step. The coefficient for ethnicity ($B=1.01$, $p=.001$) was positive, which suggested that minority individuals were at greater odds of having at least one violent conviction. The gender coefficient ($B=-.81$, $p=.006$) was negative, suggesting that males were more likely to have at least one violent related conviction. In step two, the group variable (JDC vs. comparison group) was added to the equation. Results of the analysis showed that the coefficient was negative ($B=-.34$), favoring the comparison group, but was not statistically significant ($p=.30$) suggesting no difference between the groups.

The outcomes of the logistic regression equations provided little support for the long-term main effect of the juvenile drug court on participants. For every outcome variable (arrests, convictions, substance related convictions and violent convictions) group membership was not a significant predictor of adult recidivism. This indicated that there was no difference in the likelihood of either group having a greater percentage of arrests or convictions.

Table 9

Binary Logistic Regression: JDC vs. Comparison Group (N=309)

Recidivism Measures		Model 1				Model 2			
		B	S.E.	Sig.	Exp (B)	B	S.E.	Sig.	Exp (B)
Arrests	Age	-0.007	0.054	0.893	0.993	-0.009	0.056	0.871	0.991
	Ethnicity (White=0)	0.471	0.349	0.177	1.601	0.474	0.349	0.175	0.623
	Gender (Male=0)	-0.456	0.277	0.1*	0.634	-0.461	0.28	0.1*	1.586
	Group (JDC=0)					0.039	0.331	0.906	0.962
	Constant	1.37	1.638	0.403	3.935	1.472	1.767	0.405	4.357
Convictions	Age	-0.016	0.053	0.763	0.984	-0.014	0.055	0.797	0.986
	Ethnicity (White=0)	0.358	0.334	0.284	0.699	0.355	0.335	0.289	1.426
	Gender (Male=0)	-0.53	0.271	0.051*	1.699	-0.526	0.274	0.055*	0.591
	Group (JDC=0)					-0.035	0.322	0.913	0.965
	Constant	1.594	1.608	0.321	4.923	1.549	1.659	0.35	4.708
Sub. Related Convictions	Age	0.003	0.05	0.948	1.003	0.013	0.052	0.805	1.013
	Ethnicity (White=0)	0.1	0.304	0.743	1.105	0.087	0.304	0.774	1.091
	Gender (Male=0)	-0.403	0.258	0.118	0.668	-0.382	0.26	0.142	0.683
	Group (JDC=0)					-0.201	0.302	0.506	0.818
	Constant	0.757	1.512	0.617	2.132	0.513	1.558	0.742	1.67
Violent Convictions	Age	-0.009	0.052	0.868	0.991	0.004	0.053	0.936	1.004
	Ethnicity (White=0)	1.015	0.301	0.001**	2.758	1.003	0.302	0.001**	2.726
	Gender (Male=0)	-0.811	0.296	0.006**	0.444	-0.786	0.298	0.008**	0.456
	Group (JDC=0)					-0.341	0.335	0.309	0.711
	Constant	-0.583	1.578	0.712	0.558	-0.905	1.61	0.574	0.405

Sub. Related Convictions=substance related convictions.
Group variable: the juvenile drug court group and the comparison group.
*p<.10, **p<.05

Table 10

Binary Logistic Regression: Gender by Group Interaction (N=309)

Recidivism Measures	Model 1				Model 2				Model 3				
	B	S.E.	Sig.	Exp (B)	B	S.E.	Sig.	Exp (B)	B	S.E.	Sig.	Exp (B)	
Arrests	Age	-0.007	0.054	0.893	0.993	-0.009	0.056	0.871		-0.014	0.057	0.802	0.986
	Ethnicity (White=0)	0.471	0.349	0.177	1.601	0.474	0.349	0.175	1.606	0.515	0.353	0.144	1.673
	Gender (Male=0)	-0.456	0.277	0.1*	0.634	-0.461	0.28	0.1*	0.631	-0.654	0.323	0.043**	0.52
	Group (JDC=0)					0.039	0.331	.906	1.04	-0.262	0.408	0.522	0.77
	Group * Gender									0.763	0.65	0.24	2.145
Convictions	Constant	1.37	1.638	0.403	3.935	1.42	1.692	0.401	4.137	1.629	1.707	0.34	5.098
	Age	-0.016	0.053	0.763	0.984	-0.014	0.055	0.797	0.986	-0.022	0.056	0.692	0.978
	Ethnicity (White=0)	0.358	0.334	0.284	1.43	0.355	0.335	0.289	1.426	0.42	0.339	0.216	1.521
	Gender (Male=0)	-0.53	0.271	0.051*	0.589	-0.526	0.274	0.055*	0.591	-0.826	0.318	0.009**	0.438
	Group (JDC=0)					-0.035	0.322	0.913	0.965	-0.489	0.393	0.213	0.614
Sub. Related Convictions	Group * Gender									1.17	0.638	0.067*	3.223
	Constant	1.594	1.608	0.321	4.923	1.549	1.659	0.35	4.708	1.878	1.681	0.264	6.542
	Age	0.003	0.05	0.948	1.003	0.013	0.052	0.805	1.013	0.007	0.052	0.893	1.007
	Ethnicity (White=0)	0.1	0.304	0.743	1.105	0.087	0.304	0.774	1.091	0.135	0.308	0.661	1.144
	Gender (Male=0)	-0.403	0.258	0.118	0.668	-0.382	0.26	0.142	0.683	-0.624	0.302	0.039**	0.536
Violent Convictions	Group (JDC=0)					-0.201	0.302	0.506	0.818	-0.552	0.371	0.137	0.576
	Group * Gender									0.929	0.599	0.121	2.531
	Constant	0.757	1.512	0.617	2.132	0.513	1.558	0.742	1.67	0.757	1.573	0.63	2.132
	Age	-0.009	0.052	0.868	0.991	0.004	0.053	0.936	1.004	-0.006	0.055	0.914	0.994
	Ethnicity (White=0)	1.015	0.301	0.001**	2.758	1.003	0.302	0.001**	2.726	1.153	0.316	0.00**	3.167
Violent Convictions	Gender (Male=0)	-0.811	0.296	0.006**	0.444	-0.786	0.298	0.008**	0.456	-1.377	0.371	0.00**	0.252
	Group (JDC=0)					-0.341	0.335	0.309	0.711	-1.156	0.459	0.012**	0.315
	Group * Gender									2.287	0.705	0.001**	9.843
Constant	-0.583	1.578	0.712	0.558	-0.905	1.61	0.574	0.405	-0.503	1.644	0.76	0.605	

Sub. Related Convictions= substance related convictions
Group variable: the juvenile drug court group and the comparison group.
*p<.10, **p<.05

Gender by Group Interaction

Previous studies have shown that females tend to do better than males in juvenile drug court (Hickert et al., 2010; Sloan, Smykla, & Rush, 2004; Sullivan, Blair, Latessa, & Sullivan, 2014; Thompson, 2004). Because of these findings, this study explored any effects gender had on group outcomes. The gender by group interaction was examined using all the binary recidivism outcome measures (arrests, convictions, substance related convictions and violent convictions). The results of the binary logistic regression for the gender by group interaction are shown in Table 10.

Age, gender, and ethnicity were entered in step one of the regression equation. Gender was the only variable that was significant at step one. The coefficient for gender was negative ($B=-.45$, $p=0.1$) which suggested that in step one males were more likely to have an adult arrest. The group variable (JDC vs. comparison group) was added in step two. Again, this coefficient was not significant. The interaction term for gender by group was added in step three. By adding this variable, it tested if gender had any effect on the group recidivism measures. The coefficient for the gender by group interaction was positive ($B=.76$) but not significant ($p=.24$). The positive coefficient suggests that the drug court effect is different for males than females. Drug court seemed to increase the odds that males had at least one adult arrest relative to the males in the comparison group. The opposite was true for females. Drug court seemed to decrease the odds of being arrested at least once in adulthood for females in the drug court group in contrast to females in the comparison group. An examination of the cross tabulation (contingency results) showed that 78 percent of juvenile drug court males and 65.3 percent of males in the comparison group had at least one adult arrest. The likelihood ratio value was significant for males at the alpha .10 significance level (chi-square= 3.15, $df=1$, $p=.09$). Among females, 67.1 percent of the

juvenile drug court females had at least one adult arrest while 74.1 percent of females in the comparison group had at least one arrest. The likelihood ratios for females was not statistically significant (chi-square=.52, df=1, p=.46).

To determine if gender was suppressing the log odds of conviction by group, a binary logistic regression was used. Step one controlled for age, gender, and ethnicity. Gender was the only variable that was significant in step one. The coefficient for gender was negative and statistically significant ($B=-.53$, $p=.05$), which indicated that in step one males were more likely than females to be convicted. In step two of the equation, the group variable (JDC vs. comparison group) was added. Like in the arrest outcomes, this effect was not significant. In order to observe the interaction effect of gender by group, an interaction term was added in step three. The results of the equation revealed that gender was suppressing the outcome results. In the final model, the gender coefficient was negative ($B=-.82$) and statistically significant ($p=.009$) and the group coefficient was negative ($B=-.48$) but not statistically significant ($p=.21$). Interpretation of these results would suggest that males were significantly more likely to be convicted than females, and juvenile drug court participants were slightly more likely to be convicted than the comparison group. The main effect coefficient for the group by gender interaction was positive ($B=1.17$) and moderately significant at the alpha .10 significance level ($p=.06$). Drug court appeared to increase the odds of being convicted for juvenile drug court males compared to the males in the comparison group. Among the females, drug court appeared to decrease the odds of being convicted for juvenile drug court females compared to females in the comparison group. Examination of the cross tabulation showed that 78 percent of juvenile drug court males were convicted of an offense as an adult compared to 61 percent of the comparison group males. The likelihood ratio value was significant for males (chi-square = 5.32,

1 df, $p = .02$). Among females, the corresponding percentages for drug court females and females in the comparison group were 63 percent and 74 percent, respectively, but the likelihood ratio was not significant for females (chi-square = 1.23, 1 df, $p = .26$).

As mentioned previously, the measure of substance related convictions was of specific interest for this study. One of the main goals of the North Dakota's juvenile drug court was to reduce substance use through the drug court program and mandatory treatment (NDJCS, 2007). Therefore, if the juvenile drug court successfully met this goal, the measures of substance related convictions should be lower for the juvenile drug court participants. To further examine the outcome results, a logistic regression was run. The first step of the equation controlled for age, gender, and ethnicity. None of these variables were statistically significant at in model one. The group variable (JDC vs. comparison group) was added in step two. In step three, the gender by group interaction term was added. The gender coefficient was statistically significant ($p = .03$) but the group variable was not ($p = .13$). The gender by group interaction did not reach statistical significance ($p = .12$). The group by gender interaction coefficient was positive ($B = .92$) which indicated that the drug court effect might be different for males than females in relation to substance related convictions. The drug court appeared to increase the odds of substance related convictions for juvenile drug court males in contrast to males in the comparison group. Females seemed to benefit from juvenile drug court participation as drug court participation decreased their odds of having a substance related conviction compared to the comparison females. The findings should be taken with caution due to the lack of statistical significance. The cross tabulation showed that 72.8 percent of juvenile drug court males and 53.1 percent of the comparison group males had at least one adult substance related conviction. The likelihood ratio was significant for males (chi-square=6.61, df=1, $p = .01$). Among the females, 59.2 percent of the

juvenile drug court females had at least one substance related conviction compared to 67.7 percent of the comparison females. The likelihood ratio for females was not significant (chi-square=.68, df= 1, p=.407).

To determine if gender was suppressing the log for violent convictions, a logistic regression equation was run. In step one age, gender, and ethnicity were entered. Both ethnicity and gender were significant in step one. The ethnicity coefficient was positive (B=1.01, p=.001), which indicated that minority participants were more likely than white participants to have at least one violent conviction. The gender coefficient was also significant, but it was negative (B=-.81, p=.006). This suggested that in step one, males were more likely than females to be convicted for a violent offense. In step two, the grouping variable was added (JDC vs. comparison group) and then in step three the gender by group interaction term was added. Similar to the previous measures, the addition of the gender by group interaction term increased the ethnicity, gender, and group coefficients, all of which were statistically significant in model three. These increases suggested that the group by gender interaction might have been suppressing the main effect for ethnicity, group and gender. The group by gender interaction variable was significant at the alpha .05 significance level (p=.001). The coefficient for the gender by group interaction variable was positive (B=2.28) which indicated that the drug court effect was different for males than females in regard to the violent convictions. Within this measure, drug court appeared to increase the odds that males will have a violent conviction, relative to the comparison group and reduced the odds that drug court females will have a violent conviction relative to comparison group females. The cross tabulations showed that 39.3 percent of drug court males had an adult violent conviction whereas only 16.3 percent of the comparison group males had a violent conviction. The likelihood ratio for men was statistically significant (chi-square=9.83, df=1, p=.002).

Among the females, 82.9 percent of the females in the drug court group had an adult violent conviction and 67.7% of females in the comparison group had a violent conviction. The likelihood ratio for females was significant (chi-square= 2.82, df=1, p=.092).

Overall, the binary logistic regression equations that accounted for the gender by group interaction revealed interesting results. For all four measures of recidivism (arrests, convictions, substance related convictions and violent convictions) it was evident that there was a gender by group interaction, which indicated that drug court effect sizes were different for males and females. In all the measures, the results showed that drug court participation increased the odds of recidivism for males in contrast to the males in the comparison group. At the same time, drug court had an opposite effect for females. Drug court participation decreased that odds of recidivism for females in contrast to the females in the comparison group. These findings highlighted the importance of examining the influence gender has on outcome measures and suggested that juvenile drug court might have had a positive effect on females and a negative effect on males.

Table 11

Binary Logistic Regression: JDC Graduates vs. Non-completers (N=240)

Recidivism Measures	Model 1				Model 2				
	B	S.E.	Sig.	Exp (B)	B	S.E.	Sig.	Exp (B)	
Arrests	Age	-0.032	0.063	0.606	0.968	-0.032	0.063	0.605	0.968
	Ethnicity (White=0)	0.366	0.379	0.333	1.443	0.367	0.38	0.334	1.444
	Gender (Male=0)	-0.645	0.325	0.047**	0.524	-0.647	0.329	0.05**	0.524
	JDC Status (Grad=0)					-0.008	0.305	0.98	0.992
	Constant	2.196	1.893	0.246	8.989	2.202	1.906	0.248	9.04
Convictions	Age	-0.035	0.062	0.57*	0.965	-0.035	0.062	0.571	0.965
	Ethnicity (White=0)	0.363	0.372	0.33	1.437	0.362	0.374	0.333	1.436
	Gender (Male=0)	-0.828	0.321	0.01**	0.437	-0.827	0.324	0.011**	0.437
	JDC Status (Grad=0)					0.007	0.302	0.983	1.007
	Constant	2.282	1.875	0.223	9.801	2.278	1.888	0.228	9.754
Sub. Related Convictions	Age	0.008	0.058	0.885	1.008	0.009	0.058	0.883	1.009
	Ethnicity (White=0)	0.047	0.339	0.89	1.048	0.044	0.34	0.896	1.045
	Gender (Male=0)	-0.607	0.305	0.046**	0.545	-0.603	0.308	0.05**	0.547
	JDC Status (Grad=0)					0.026	0.285	0.927	1.026
	Constant	0.73	1.753	0.677	2.074	0.71	1.766	0.688	2.034
Violent Convictions	Age	-0.012	0.06	0.843	0.988	-0.008	0.06	0.887	0.992
	Ethnicity (White=0)	1.224	0.353	0.001**	3.399	1.208	0.354	0.001**	3.348
	Gender (Male=0)	-1.407	0.378	0.000**	0.245	-1.369	0.382	0.000**	0.254
	JDC Status (Grad=0)					0.4	0.293	0.172	1.492
	Constant	-0.337	1.798	0.851	0.714	-0.649	1.812	0.72	0.523

Sub. Related Convictions=substance related convictions.
 JDC Status: Group variable: graduates and non-completers.
 *p<.10, **p<.05

Juvenile Drug Court Participants: Terminated vs. Graduates

To examine the log odds of recidivism between juvenile drug court graduates and those who were terminated from the program, binary logistic regression equations were run. These equations tested whether one group had a higher likelihood of recidivating in adulthood. Binary logistic regression equations were run for all the binary recidivism measures: arrests, convictions, substance related convictions and violent convictions. The group variable for these equations was juvenile drug court status; if juvenile drug court participants graduated or if they did not complete the program. Table 11 shows the results for the logistic regression equations.

In step one age, gender, and ethnicity were entered. At this step, gender was the only variable that was statistically significant ($p=.04$). The gender coefficient was negative, which indicated that at this level males were more likely to have an adult arrest. In the second step, the group variable (graduates vs. non-completers) was added. The results of the equation produced a negative coefficient ($B= -.008$) but these findings were not statistically significant ($p=.98$). Both the juvenile drug court graduates and those who did not complete the program had an equal likelihood of having at least one adult arrest.

Even though there were no statistical differences regarding the likelihood of being arrested, the patterns could have been different for conviction. To determine the log odds of having at least one adult conviction, a binary logistic regression equation was run. Age, gender, and ethnicity were entered in step one. Gender was the only variable that was significant ($p=.01$), and indicated that in step one males were more likely than females to be convicted in adulthood. In step two, the group variable (graduates vs. non-completers) was added. For the log odds of having at least one conviction in adulthood, the coefficient was positive ($B=.007$) but was not

statistically significant ($p=.22$). Thus, there appeared to be no difference between the two groups in the log odds of adult conviction.

One of the main focuses of North Dakota's juvenile drug courts was to reduce substance usage. When looking at the two groups of juvenile drug court participants, it was assumed that because the graduates had a longer time in the program their substance use conviction patterns would look different in adulthood, relative to the terminated participants. To examine this, a binary logistic regression equation was run. In step one age, gender, and ethnicity were controlled for. Gender was the only variable that was statistically significant ($p=.04$), which indicated that males were more likely to have a substance related conviction than females in model one. In step two, the group variable (graduates vs. non-completers) was added to the equation. Results of the equation revealed a positive coefficient ($B=.02$) which indicated that the non-completer group had a slightly higher likelihood being convicted for a substance related offense compared to the graduates. However, these results were not statistically significant ($p=.92$). These findings suggest that juvenile drug court graduates did not benefit from more exposure to the drug court program in regards to the likelihood of being convicted of a substance related offense.

To determine the log odds of violent conviction in adulthood within the graduate and the non-completer groups, a binary logistic regression was run. In step one of the equation age, gender, and ethnicity were all controlled for. Both gender and ethnicity were statistically significant in step one ($p=.000$, $p=.001$, respectively). This indicated that in step one, male participants and minority participants had a greater likelihood of being convicted of a violent offense in adulthood. In step two, the group variable (graduates vs. non-completers) was added. The results for step two revealed a positive coefficient ($B=.40$) which suggested that graduation

from juvenile drug court decreased the odds of being convicted for a violent offense in adulthood. These results, however were not statistically significant ($p=.17$).

For all measures of recidivism outcomes (arrest, convictions, substance related convictions and violent convictions) the logistic regression results showed no statistical differences between those who graduated from the juvenile drug court and those who participated but did not complete the program. Results showed that neither group had higher log odds for any of the recidivism measures. These findings produced little support for the effectiveness of the juvenile drug court intervention.

Linear Regression Results

The binary logistic regression equations examined the log odds of recidivism. These equations did not examine the frequency of offending between groups. To examine any differences between groups in the frequency of offending, linear regression equations were performed. Linear regression equations were run for the following recidivism outcome measures: total number of arrests, total number of convictions, total number of substance related convictions and total number of violent convictions. Table 12 shows the results for the linear regression equations.

In step one, age, gender, and ethnicity were controlled for. Gender was statistically significant in model one of the equation, and indicated that in step one males had a higher frequency of arrests relative to females. In step two, the group variable (JDC vs. comparison group) was added. Results of the linear regression for total adult arrests produced a negative coefficient ($B= -2.14$) and the results were statistically significant ($p=.03$). The negative coefficient indicated that the juvenile drug court participants had a higher frequency of total arrests in contrast to the comparison group.

While collecting the data, numerous arrests did not result in a conviction after charges were dismissed or dropped. To determine if there were any differences between groups based on the frequency of convictions, a linear regression equation was used. In step one age, gender, and ethnicity were added to the equation. Gender was the only variable that was statistically significant in model one. Similar to the previous analysis, in step one males had a higher frequency of convictions than females. In step two, the group variable (JDC vs. comparison group) was added. The coefficient for the group variable was negative ($B=-1.95$) and significant ($p=.03$). The negative coefficient revealed that juvenile drug court participants had a higher frequency of adult convictions relative to the comparison group. The linear regression for total adult convictions favored the comparison group as it was indicated that they had a lower frequency of convictions than the juvenile drug court participants.

Linear regression was also run on the total number of substance related convictions. If juvenile drug courts had any effects on participants' substance use, it would be expected that the juvenile drug court group would have a lower frequency of substance use convictions in relation to the comparison group. In step one of the linear regression equation age, gender, and ethnicity were controlled for. Similar to the previous equations, gender was the only variable that was statistically significant. In step two, the group variable (JDC vs. comparison group) was added. The results of the linear regression analysis did not find strong evidence in support of juvenile drug court's ability to reduce substance related convictions. The coefficient was negative ($B=-.83$) and was significant ($p=.09$). The negative coefficient indicated that the juvenile drug court participants had a higher frequency of substance related conviction in adulthood in contrast to the comparison group.

The last frequency measure tested in this study was the total number of violent offense convictions. In the linear regression equation age, ethnicity, and gender were all controlled for in step one. Ethnicity was the only variable that was statistically significant. This indicated that in step one, minority participants had a higher frequency of violent convictions compared to white participants. Step two included the addition of the group variable (JDC vs. comparison group). The linear regression equation found no statistically significant differences between the groups on total number of violent related convictions ($B=-.22$, $p=.33$). Even though there is no statistical significance, the trend shows that juvenile drug court participants had a slightly higher amount of violent convictions than the comparison group.

The linear regression equations indicated that juvenile drug court participants had higher frequencies of arrests and convictions in contrast to the comparison group. Several of these coefficients were statistically significant. However, there was no statistical difference between groups for the frequency of violent convictions. Overall, these results showed little support for any positive long-term effects of juvenile drug courts. In almost every measure of frequency, the juvenile drug court participants had worse outcomes than the comparison group.

Table 12

Linear Regression: JDC vs. Comparison Group (N=309)

Recidivism Measure		Model 1				Model 2			
		B	S.E.	t	Sig	B	S.E.	t	Sig
Total Arrests	Age	-0.172	0.163	-1.058	0.291	-0.075	0.168	-0.446	0.656
	Ethnicity (White=0)	0.823	0.989	0.832	0.406	0.704	0.985	0.714	0.475
	Gender (Male=0)	-2.915	0.861	-3.387	0.001**	-2.684	0.862	-3.113	0.002
	Group (JDC=0)					-2.14	0.997	-2.146	0.033**
	Constant	14.869	5.141	2.892	0.004**	14.291	5.118	2.793	0.033**
Total Convictions	Age	-0.22	0.148	-1.491	0.137	-0.132	0.153	-0.863	0.389
	Ethnicity (White=0)	0.7	0.899	0.779	0.437	0.592	0.895	0.661	0.509
	Gender (Male=0)	-2.62	0.782	-3.35	0.001**	-2.409	0.784	-3.074	0.002**
	Group (JDC=0)					-1.954	0.906	-2.157	0.032**
	Constant	15.255	4.672	3.265	0.001**	14.728	4.651	3.167	0.002**
Sub. Related Convictions	Age	-0.088	0.08	-1.1	0.272	-0.05	0.082	-0.605	0.545
	Ethnicity (White=0)	-0.052	0.484	-0.107	0.915	-0.098	0.484	-0.203	0.839
	Gender (Male=0)	-1.337	0.421	-3.173	0.002**	-1.247	0.423	-2.946	0.003**
	Group (JDC=0)					-0.83	0.489	-1.695	0.091*
	Constant	7.253	2.517	2.882	0.004**	7.029	2.513	2.797	0.005**
Violent Convictions	Age	-0.02	0.038	-0.532	0.595	-0.01	0.039	-0.254	0.8
	Ethnicity (White=0)	0.714	0.228	3.127	0.002**	0.702	0.229	3.068	0.002**
	Gender (Male=0)	-0.058	0.199	-0.293	0.769	-0.034	0.2	-0.171	0.864
	Group (JDC=0)					-0.222	0.231	-0.96	0.338
	Constant	1.155	1.186	0.973	0.331	1.095	1.188	0.922	0.357

Sub. Related Convictions= substance related convictions.
 Group variable: juvenile drug court group and the comparison group.
 *p<.10, **p<.05

CHAPTER 5: CONCLUSION

Due to the lack of long-term studies in the juvenile drug court literature, this study acted as an exploratory study to assess the effect of juvenile drug court on adulthood recidivism. This study sought to answer four research questions: (1) Does juvenile drug court participation affect the likelihood and frequency of adulthood arrests? (2) Does juvenile drug court participation affect the likelihood and frequency of adulthood convictions? (3) Does gender impact the recidivism outcomes for the juvenile drug court group and the comparison group? (4) Does graduation from juvenile drug court have any effect on adult recidivism in comparison to non-completers of juvenile drug court?

Research Question One: Arrests by Group

The analysis indicated that juvenile drug court participants had the same log odds of being arrested at least once as an adult in relation to the comparison group. The binary logistic regression revealed that there were no statistically significant group differences in the likelihood of being arrested as an adult. When the frequency of arrests were evaluated, there were significant findings. The findings suggested that the juvenile drug court group had a higher amount of adult arrests in contrast to the comparison group.

Research Question Two: Convictions by Group

The second research question focused on adult convictions, and inquired whether juvenile drug court participation had any effect on adulthood convictions. Data was collected for general convictions, substance related convictions, and violent convictions. Group membership was not a significant predictor of being convicted in adulthood. When the frequency of convictions was examined, there was a significant difference. A linear regression equation showed that the juvenile drug court participants had a higher amount of convictions than the comparison group.

Similar to the arrest findings, juvenile drug court seemed to have no positive effect on reducing future convictions.

This study was especially interested in the findings for substance related convictions due to the nature of the intervention being studied (juvenile drug court). One of the main goals of juvenile drug court was to address substance use. Therefore, if the drug court programs were successful, it is appropriate to assume that the effects of the program would be seen in a substance related measure. The findings of this study revealed that group membership was not a predictor of substance related convictions in adulthood. Participation in the juvenile drug court seemingly had no impact on a juvenile's likelihood of being convicted of a substance related offense as an adult when compared to the individuals who did not participate in the juvenile drug court. When the frequency of adult substance related convictions was examined, the results indicated that the juvenile drug court participants had a higher frequency of substance use convictions than the comparison group. This outcome was significant even after controlling for age, ethnicity, and gender. These findings suggest that North Dakota's juvenile drug court programs did not reduce future substance use among participants.

Group membership was not a significant predictor of adulthood violent convictions. A linear regression equation also found no statistical difference between groups in regard to the frequency of being convicted for violent offenses. Because the groups were similar as youths, these findings show that the juvenile drug court programs had little effect on reducing future recidivism and reducing the likelihood of participants being convicted for criminal offenses as adults.

Research Question Three: Gender and Group Interaction

Past literature has shown that gender influences recidivism for juvenile drug court participants. Female drug court participants tend to do better than the males and are less likely to recidivate (Hickert et al., 2010; Sloan, Smykla, & Rush, 2004; Sullivan, Blair, Latessa, & Sullivan, 2014; Thompson, 2004). The logistic regression group results, described above, provided little support for the juvenile drug court programs as far as their ability to reduce recidivism. However, it may be that drug court females fared far better than drug court males, thereby suppressing the main effect of drug court on recidivism. When the gender by group interaction term was introduced, gender functioned as a suppressor of the outcome measures. The gender by group interaction showed that in most of the recidivism measures males in the juvenile drug court group fared worse than males in the comparison group. Female drug court participants however, had lower recidivism odds than the comparison group females. This revealed that the juvenile drug court effect was different for males and females. This data suggested that juvenile drug court participation had a positive effect only for females. Overall, juvenile drug court participation for males increased the log odds of recidivism while juvenile drug court participation for females decreased the log odds of adulthood recidivism.

Evidence that females in the juvenile drug courts had lower recidivism rates compared to males is consistent with findings from previous studies (Carey, Waller, & Marchand, 2006; Hickert, Becker, & Prospero, 2010; Sloan, Smykla, & Rush, 2004; Sullivan, Blair, Latessa, & Sullivan, 2014; Thompson, 2004). However, the suppressing effect of gender was not fully expected. The results of this study clearly showed that juvenile drug court had some positive effect on female participants, but not on male participants. Males who did not participate in the

juvenile drug court tended to be less likely to recidivate compared to the males in the juvenile drug court group.

Understanding the reasons why females in the juvenile drug court group did better than the males and why males in the comparison group did better than females was outside the scope of this study. Carey and colleagues (2006) found that females in their study were more likely to graduate juvenile drug court and less likely to commit future offenses. They suggested that females might have benefited more from juvenile drug court because females tend to have higher rates of mental health diagnoses, especially depression and anxiety, due to their tendency to internalize stress. They indicated that juvenile drug courts might be more effective for females because the program is able to address and provide treatment for the female's mental health issues. Further research would benefit from examining how gender influences the effect juvenile drug courts have in reducing recidivism.

Addressing how and why gender impacted the adult recidivism measures would allow for juvenile drug courts to modify their programs to better address these gender differences. These modifications might improve their overall effect on adulthood recidivism, especially for males. One example of a program modification would be post program follow-ups for male graduates. The juvenile drug court programs in this study had no follow-up after leaving the program. Post-program follow-ups might help enforce the positive behaviors learned in drug court for males. Juvenile drug court participation seemed to have little or no effect for males, so another consideration may be to leave male juvenile offenders in traditional probation. These are all ideas that should be explored in future research.

Research Question Four: Graduates vs. Non-completers of Juvenile Drug Court

Within the juvenile drug court group, this study assessed whether there was a difference in adulthood recidivism between participants who graduated from the drug court program and those participants who did not complete the program. This question was important to see if successful completion of the program had any positive effect on adulthood recidivism. Results of the logistic regression for all measures found that group membership was not a significant predictor of adult recidivism. This finding suggested that successful completion of the juvenile drug court program had no effect on reducing future recidivism. Graduating and longer exposure to the program did not have any effect of future recidivism.

Limitations

The results of this study provided insight on the long-term effects juvenile drug courts have on adult criminality. The study did face some limitations that should be taken into consideration. One of the larger limitations was the use of secondary data. Although using the secondary data allowed for a long term follow up period, the data was limited. The sample size was small, and because it was secondary data, there was no way to increase the sample size. The small sample size may have influenced the ability to obtain statistical significance for certain statistical analyses. Due to the limitations of secondary data, this study was limited to demographics and variables that had originally been collected. For example, the mental health diagnoses of the juveniles would have been a valuable factor to consider in this study. It would have been interesting to see if there was any association between recidivism outcomes and juvenile mental health diagnoses. Unfortunately, there was too much missing data on mental health diagnoses to include a mental health variable in the analysis of the current study. Because of missing data, this study was not able to further investigate possible reasons why females in the

comparison group fared worse than males in the comparison group, while the females in the juvenile drug court fared better than the males. Further research on the long-term effects of juvenile drug courts should take into consideration other variables that might influence adulthood criminal behavior and use a larger sample.

Another limitation of this study was selection bias. The sampling method was not random and did not result in a representative sample of juvenile offenders in North Dakota. In order to reduce any differences between groups, all participants in both groups had to meet the eligibility requirements for the juvenile drug court program. This study looked at age, gender, positive mental health diagnoses, first drug of choice, ethnicity, site location, and family make up. This study attempted to reduce any differences between groups using statistical controls, but selection bias and a non-representative sample were limitations of this study. Future studies should attempt to use random selection to create a representative sample.

Another limitation this study faced was the possibility of attrition. This study searched criminal records for Minnesota and North Dakota. Because of this, if any individual had a criminal record outside of Minnesota or North Dakota, their adult records would not be included in this study. It was assumed that individuals from each group would move out of these states at an equal rate, but this was merely an assumption. Due to the parameters of this study, only adult records from North Dakota and Minnesota were collected leaving the possibility of out of state criminal offenses to go unrecorded. Future research should take this into consideration and attempt to use national criminal record databases to reduce the possibility of attrition.

This study did not control for time, which was another study limitation. By not controlling for time, the participants had unequal opportunities to recidivate as adults. For example, at the time this study was conducted the oldest individual in this study was almost 35

years old. The youngest individual was just over 24 years old. Without controlling for time, the 35 year old had about eight more years to recidivate as an adult compared to the 24 year old. Because some of the individuals in the study had more time to recidivate as adults, this potentially might have affected the results. Controlling for time should be addressed in future long term-term studies on juvenile drug court.

The last major limitation of the study was the possibility of treatment misidentification. Due to the nature of both longitudinal studies and the use of secondary data, there was a lack of additional information for these participants. The only intervention recorded in this study was juvenile drug court or traditional juvenile probation. It is possible that other interventions such as additional treatment, education, getting married, or having a family had an impact on the participants and their adulthood criminality. Therefore, it is difficult to say that any changes or differences in the groups was solely caused by juvenile drug court participation. Further studies should take into consideration the possibility of alternative interventions that may affect participants' criminality when measuring the long-term effects of juvenile drug courts.

Closing Remarks

The purpose of this study was to explore any long-term effects juvenile drug courts had on adult offending. By comparing juvenile drug court participants to traditional probation youth, the results of the study found little support for juvenile drug courts. The results of the study produced few recidivism differences between the comparison group and the juvenile drug court group, and when there were differences they were in favor of the comparison group. The study did find that gender was an important factor to consider when evaluating juvenile drug court outcomes. The study revealed that the effects of juvenile drug court were different for male and female participants. Drug court participation seemed to only benefit female participants, as it

decreased their odds of recidivism in relation to the females in the comparison group. Drug court participation had a negative effect on males, as participation increased the likelihood of recidivism in relation to males in the comparison group. These findings suggest that juvenile drug court participation may benefit female juveniles and decrease their likelihood of recidivism in adulthood, but may increase the risk of adulthood recidivism for males. The results of this study raise the question regarding how juvenile drug courts can modify their programs to have a positive effect on both male and female participants. Further research is needed to examine the long-term effects of juvenile drug courts.

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