WHAT ABOUT THE B-LISTERS? AN OFFENDER ANALYSIS OF THE HIGH POINT DRUG MARKET INTERVENTION

By

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ABSTRACT

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The current study examines the effect of participation in the High Point Drug Market Intervention (DMI) on re-offending post intervention. The DMI is a program that attempts to eliminate overt open-air drug markets through a focused deterrence approach. This approach involves targeting the individuals driving the crime problem in a targeted area, and enhancing the threat of criminal sanctions while at the same time offering help from the community and social service providers. By increasing the perceived likelihood and severity of the sanctions for those most likely to be involved in committing crimes in the area, it is expected that the offenders' perceptions of risk will be altered and they will be deterred from offending. Using survival analysis to compare the recidivism patterns of participants in the program relative to those of an equivalent comparison group, this dissertation examines the DMI's deterrent effect on the offenders targeted to participate in the program. While studies on the DMI have found it to have a positive crime-control effect in the communities where it is implemented, participant outcomes at the individual level have not been examined. This study addresses this gap in the literature by providing a more complete understanding of the DMI's impact on the offenders targeted to participate in the program.

The findings suggest that offenders who participated in the DMI were arrested faster and were at greater risk of arrest for prohibited offenses than those in the comparison group. While these results are not consistent with what was hypothesized, they may indicate success for the law enforcement follow-up component of the intervention. The findings also suggest that there was no difference in time to re-arrest and risk of re-arrest between the DMI and comparison group for drug offenses and any offense. Overall, the findings indicate that participation in the DMI did not have a deterrent effect on the targeted offenders. Future research should focus on components of the intervention that are thought to influence offender behavior such as social services, family involvement, enforcement consequences, the call-in process, and deterrence message to determine if they are having the expected affect on the targeted offenders.

I dedicate this dissertation to my parents Janet and Derek, and my brother Sean.

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CHAPTER 1: INTRODUCTION

Researchers and law enforcement officials have started to develop new innovative intervention strategies to help combat a number of different crime problems. In accordance with these strategies, police have begun to shift their enforcement efforts to specific crime problems, situations, and places, focusing police strategies on hot spots and crime mapping (Weisburd, 2008). Particular criminal justice interventions have employed a problem-oriented policing approach, focusing on identifying specific crime problems that are affecting a community, and in collaboration with that community, developing strategies that target the underlying conditions causing those crime problems (Braga et al., 1999; Klofas, Hipple, & McGarrell, 2010; Goldstein, 1979). These interventions are implemented with the expectation that they will decrease the crime rate by deterring offenders and potential offenders through intense focus on a specific crime problem in a concentrated area. One such strategy that has become popular in recent years is focused deterrence.

The focused deterrence strategy involves identifying a specific crime problem in a targeted area, enhancing the threat of criminal sanctions for the individuals who are driving the problem, and deliberately and consistently communicating that threat to them. By increasing the threat of criminal sanctions for those most likely to be involved in committing crimes in the targeted area, it is expected that crime in that area will be reduced and the targeted offenders will be deterred from committing the prohibited behaviors. This strategy has quickly grown in popularity and has been applied to a number of crime problems including gang and group violence (Braga et al., 2001; Braga, McDevitt, & Pierce, 2006; Kennedy & Braga, 1998), open-air drug markets (Corsaro, Brunson, & McGarrell, 2010; Frabutt, Shelton, DiLuca, Harvey, &

Hefner, 2009; Hipple, Corsaro, & McGarrell, 2010), gun violence (Corsaro & McGarrell, 2009, 2010; McGarrell et al., 2006; Papachristos, Meares, & Fagen, 2007), and most recently domestic violence (Sechrist, Weil, Shelton, & Payne, 2012). Scholars argue that these types of police interventions provide an effective approach for gaining both specific and general deterrence against crime (Braga & Weisburd, 2012). Focused deterrence strategies have been found to be effective at reducing crime rates and improving the conditions of affected communities (Braga & Weisburd, 2012), suggesting a positive general deterrent effect at the community level. This approach also has potential to be effective at the individual level, deterring offenders specifically targeted by the interventions; however research conducted on focused deterrence strategies typically have not examined what happens to these individuals.

In 2003, in response to the high levels of overt open-air drug activity in their city, the High Point Police Department in North Carolina developed the Drug Market Intervention (DMI). The DMI uses a focused deterrence strategy in an attempt to eliminate open-air drug markets and prevent and control crime and violence related to those markets (e.g., prostitution, homicide, gun assault, sexual assault, and other serious violence). Studies have found the DMI in High Point to be effective at reducing crime and violence associated with their drug markets (Frabutt et al., 2009; Hipple, Corsaro, & McGarrell, 2010). High Point noted an average decline of roughly seven percent for violent crimes, nine percent for property crimes, and six percent for drug and nuisance offenses following the intervention (comparing 24 months pre-and post-intervention) (Hipple, Corsaro, & McGarrell, 2010). While studies on the DMI have found it to have a positive crime-control effect in the communities where it is implemented, participant outcomes at the individual level have not been examined.

The purpose of this research is to analyze the deterrent effect of the High Point Drug Market Intervention on the offenders targeted by the intervention, also known as B-listers. The current study extends previous research by providing a more complete understanding of the DMI's impact on those targeted to participate in the program, rather than the larger community-level effects of the intervention. Although focused deterrence strategies like the DMI are meant to be community-based interventions, developed and implemented to reduce violence and crime problems in affected communities[1] (Braga et al., 2008; Corsaro & McGarrell, 2010; Rivers, Norris, & McGarrell, 2012), it is important to know and understand how the intervention affects those specifically targeted. If no deterrent effect on the targeted offenders is found the strategy could possibly be modified to produce the same crime-control effect in the community without exerting all the time and intense focus on the offenders. However, if the DMI is found to be effective at the community and individual level it enhances our understanding of the effectiveness of this intervention, and the focused deterrence strategy.

[1] In a study conducted by Rivers, Norris, and McGarrell (2012) examining a mental model of the High Point DMI formed through interviews with police officials, service providers, and community members involved in the DMI, they found that those interviewed realized that the success of the intervention was ultimately "contingent on addressing community disorganization and reestablishing levels of informal social control and collective efficacy necessary to prevent the drug market from reemerging in the targeted neighborhood" (pg. 71).

CHAPTER 2: FOCUSED DETERRENCE

Origins of Focused Deterrence

The focused deterrence strategy was originally developed in the mid-1990s as a tactic aimed at reducing gang and group-involved violence in Boston (Braga et al., 2001; Braga et al., 2008; McGarrell et al. 2006; Corsaro & McGarrell, 2010). Operation Ceasefire's Boston Gun Project began in 1995 as an attempt to use problem-solving policing in response to the city's youth homicide problem. A multi-agency working group was formed to research, design, and implement a strategy that would be used to help reduce violent crime and youth homicides in the city. First, their analysis indicated that gang members with prior involvement in the system committed most of the homicides; about 1,300 gang members (who accounted for less than one percent of their age group in the city) were responsible for 60 percent of all the youth homicide in the city (Braga et al., 2001; Kennedy, 1998; McGarrell et al. 2006). Based on this finding, the Projects' central goal became deterring violence by these chronic violent offenders (gang members).

The intervention that was designed consisted of two parts. Part one, the Ceasefire, involved a law enforcement attack directed at the illicit market that supplied guns to youths. Part two, the "pulling levers" strategy involved "deterring violent behavior by chronic gang offenders by reaching out directly to gangs, setting clear standards for their behavior, and backing up that message by 'pulling every lever' legally available when those standards were violated" (Kennedy, 1998, pg. 3). This strategy was built on the realization that "chronic offending made these youths and the gangs they formed, extremely vulnerable" (Kennedy, 1998, pg.5). There were a number of ways (levers to pull) that law enforcement could sanction these offenders and

impose costs on the gangs. These levers included anything that could disrupt the gang's street drug activity, such as the police focusing on: low level street crimes (e.g., trespassing or public drinking); serving outstanding warrants; cultivating confidential informants for their investigations of gang activities; delivering strict probation and parole enforcement; seizing drug proceeds and other assets; ensuring stiffer plea bargains and prosecutorial attention; and focusing Federal attention on gang-related drug activity (Kennedy, 1998).

Offender notification or "call-in" meetings were held with high risk gang members, communicating directly to them that if they continued to be involved in violence, all legally available sanctions would be levied against them and their gang. These meetings were coupled with crackdowns on gangs who continued to be involved in gun violence. The adult members of these gangs were prosecuted federally, which allowed officials to show the gang members that they were serious about reducing gun violence in the city (Kennedy, 1997; McGarrell et al. 2006). Law enforcement continually communicated to the gangs that violence would not be tolerated and if it continued so would the crackdowns. If one gang member faltered the whole gang would suffer the consequences. This strategy encouraged these groups to police themselves to avoid becoming a priority to law enforcement. The evaluation of the Ceasefire intervention suggests that it was associated with a significant reduction in youth homicide, victimization and gun assault incidents in Boston (Braga et al., 2001). The success of Boston's Operation Ceasefire spurred the implementation of a number of similar focused deterrence initiatives.

Applications of Focused Deterrence

The central goal of the focused deterrence strategy is that it can be tailored to the specific crime problem in a community. As a problem-oriented policing approach, the focus is on using an iterative strategy to identify and address the specific crime problems affecting a community.

Emphasis is placed on identifying and analyzing the specific crime problems, responding to these problems, and assessing and adjusting the response (Braga et al., 1999; Braga et al. 2008; Goldstein, 1979). After the success of Boston's Operation Ceasefire, focused deterrence strategies have been applied to a number of different crime and public safety problems, such as gun violence, firearms homicide, open-air drug markets, and most recently domestic violence.

Although there have been a number of different focused deterrence initiatives, the strategies they use follow the same general framework. A multi-stage approach is utilized, which typically consists of : (1) focusing on a specific crime problem; (2) creating a multi-agency working group of relevant law enforcement agencies; (3) systematically identifying key offenders, groups, and behavior patterns driving the crime problem; (4) developing a clear deterrent message to offenders and groups of offenders that employ a wide range of sanctions (pulling levers) to persuade them to cease their behavior; (5) focusing social services and community resources on targeted offenders and groups to complement law-enforcement efforts; and; (6) directly, clearly and repeatedly communicating to offenders why they are receiving this special attention (Kennedy, 1997, Braga et al., 2008). This approach has been effective at reducing gang violence (Braga et al., 2001; Braga, McDevitt, & Pierce, 2006; Engel et al., 2011; Kennedy & Braga, 1998), gun violence (Corsaro & McGarrell, 2009, 2010; McGarrell et al., 2006; Papachristos, Meares, & Fagen, 2007), and reducing crimes associated with drug markets (Corsaro, Brunson, & McGarrell, 2010; Frabutt et al., 2009; Hipple, Corsaro, & McGarrell, 2010).

Gangs and Groups

As mentioned above, Boston developed the focused deterrence pulling levers strategy in response to their youth homicide problem. They found that a majority of the youth homicide in

the city were committed by a small number of gang members. The strategy involved directly informing gangs that violence would not be tolerated and every available lever would be pulled if violence occurred. An analysis of the intervention strategy in Boston found a 63 percent decline in monthly average homicides among individuals 24 years old and younger, a 32 percent decrease in shots fired calls, and a 35 percent decrease in monthly gun assaults. When compared to 39 other large US cities for the same time period (1991-1997), Boston experienced the largest statistically significant decline in youth homicide (only three other cities showed statistically significant declines) (Braga et al., 2001).

Lowell, Massachusetts and Minneapolis used a focused deterrence strategy to combat gang problems. Lowell concentrated on general gang violence and it was reported that the city experienced a 24 percent reduction in gun assaults and a 50 percent reduction in homicide following the intervention (Braga, McDevitt, & Pierce, 2006). In an impact evaluation that used seven other Massachusetts cities as a comparison, Braga et al. (2008) found that the pulling levers strategy in Lowell was associated with a statistically significant reduction in gun-related homicides and aggravated assaults, which was not experienced in the other cities. The Minneapolis' intervention targeted gangs but focused on reducing homicide and reported a reduction in the pre- and post-intervention yearly totals of homicide victims (Kennedy & Braga, 1998).

The Cincinnati Initiative to Reduce Violence (CIRV) in Cincinnati, OH used a focus deterrence strategy to reduce serious violence by at-risk group members. Specifically, the objective was to reduce homicide and gun-related violence perpetrated by these groups. Engel et al. (2011) used a pooled time-series regression analysis to estimate the impact of the CIRV on group member involved homicides and non-group member involved homicides 24 and 42

months post-intervention. They found that group member involved homicides and violent firearm incidents significantly declined after implementation of the intervention. These homicides declined by 38 percent 24 months post-intervention and by 41 percent 42 months post-intervention. No such decline was found for the corresponding non-group involved homicides.

Guns

In Indianapolis, the focused deterrence strategy was used to target illegal gun carrying and gun use among known groups of chronic offenders. They focused on chronic offenders with connections to gangs, guns, and drug markets. Using an interrupted time-series design, McGarrell et al. (2006) reported a 34 percent statistically significant decline in monthly homicides following implementation of the intervention (comparing 27 months pre-and post-intervention). Corsaro and McGarrell (2009) tested whether the downward trend in homicides found previously was similar across gang and non-gang homicides, if so it could suggest that something other than the intervention was responsible for the decline. However, they found that the decline in gang homicides was significantly greater than the decline in non-gang homicides suggesting an intervention effect. Similarly, Corsaro and McGarrell, (2010) observed changes in homicide patterns for the highest risk populations (individuals age 15 to 24) in Indianapolis after a pulling levers intervention was implemented. High-risk populations experienced a statistically significant reduction in homicides. The authors also found that in neighborhoods where specific community level strategies were employed there was a statistically significant decline in high-risk homicide rates.

Chicago's Project Safe Neighborhood (PSN) targeted convicted felons who carried or used guns and coupled the deterrence message with increased federal prosecution and increased

sentence lengths. Using a quasi-experimental design, Papachristos, Meares, and Fagen (2007) found that Chicago experienced a 37 percent decline in quarterly homicide rates in the treatment area. They also found that decreases in gang related homicides were directly linked to the percentage of offenders who attended the call-ins. Additionally, another evaluation of the program found shooting declines ranging from 16 percent to 34 percent across the treatment sites in Chicago (Skogan et al., 2009).

Chermak (2008) and Papachristos et al (2013) examined the effects of their respective focused deterrence strategies on program participant recidivism. First, Chermak (2008) evaluated probationers and parolees who participated in the Indianapolis Lever-Pulling experiment. The study consisted of two treatment groups: the law enforcement group in which participants attended a call-in meeting at a court house and the deterrence message was primarily delivered by law enforcement officials, and the community group in which the participants attended a call-in at a community center and the deterrence message was primarily delivered by community members. He found no difference in the likelihood of recidivism or time to arrest post-intervention between the treatment groups and the control group. About 33 percent of the law enforcement group and the control group, and 28 percent of the community group were arrested post-intervention. And, on average, the law enforcement group survived 140 days before getting arrested, the community group survived 147 days, and the control group survived 149 days; there was no discernible difference.

Second, Papachristos et al (2013) examined the effect of PSNs offender notification forums on the recidivism of program participants relative to a control group. They found that offenders who participated in the offender notification forums experienced a significantly longer time on the street before re-arrest than those in the control group. They also found that forum

participants had a 30 percent lower hazard of committing a new offense and had a lower incidence of weapons crimes, murder, and violent crimes than those in the control group.

Open-Air Drug Markets

The application of the focused deterrence strategy to open-air drug markets was first implemented in High Point, NC, in the form of the Drug Market Intervention (DMI). Since this initial implementation the strategy has been implemented in a number of cities including Rockford, Illinois, Nashville, Tennessee and Peoria, Illinois. The DMI adopted the pulling levers model by focusing on specific drug markets, the small group of individuals working in those markets (i.e. distributors, street-level sellers, and look-outs) that are driving the problem, and directly communicating deterrence messages to them (Kennedy, 1998; Hipple, Corsaro, & McGarrell, 2010).

Studies on the DMI have found it to be effective in reducing violent, property, and drug crimes, and other behaviors associated with drug markets (Corsaro, Brunson, & McGarrell, 2010; Frabutt et al., 2009; Hipple, Corsaro, & McGarrell, 2010; Kennedy & Wong, 2009). In a study examining the High Point DMI 24 months pre-and post-intervention, Hipple, Corsaro, and McGarrell (2010) found an average decline of roughly seven percent for violent crimes, nine percent for property crimes, and six percent for drug and nuisance offenses in the targeted areas following the intervention. Examining specific neighborhoods in High Point where the intervention was implemented, Kennedy and Wong (2009) found that 5 years post-intervention the West End (the first neighborhood where the DMI was implemented) experienced a 57 percent reduction in violent crime and a 50 percent drop in gunshot calls for service. Four years post-intervention, drug crime fell by 26 percent. In the South Side, 2 years post-intervention,

violent crime dropped at an average rate of 16 percent per year; however, drug crimes increased by about 15 percent.

In Nashville, there were statistically significant reductions in property, narcotic, and drug equipment offenses and a decrease in calls for service in the target area and adjoining areas (Corsaro, Brunson, & McGarrell, 2010). Similarly, Rockford experienced a statistically significant reduction in property crime, drug crimes, and nuisance offenses associated with the pulling levers deterrence strategy in the targeted areas (Corsaro, Brunson, & McGarrell, 2009). In Peoria, however, Corsaro and Brunson (2013) found that the pulling levers intervention had no significant effect on the crime offense rate in the targeted neighborhood; although they suggest that this may be due to the lack of community awareness and involvement in the program.

Key Components Directed at the Targeted Offenders

As shown above, studies measuring the effectiveness of focused deterrence approaches have primarily concentrated on community-level outcomes (e.g. reductions in gun violence, firearm homicides, criminal activity related to drug markets, and youth violence), and have generally shown positive results. A meta-analysis on the effects of focused deterrence strategies also found that they had an overall statistically significant crime reduction effect (Braga & Weisburd, 2012), suggesting that overall the focused deterrence strategy is having a positive deterrent effect on the targeted crime in the targeted location. Although research in this area has principally focused on community-level outcomes, many components of the focused deterrence strategy are aimed at specifically deterring the individuals targeted by these strategies. The following section discusses these components and how they are directed at influencing the behavior of the targeted individuals.

Targeted Population

Focused deterrence strategies take advantage of the problem-oriented and place-based policing literature which has shown that a relatively small number of offenders are responsible for a disproportionally large amount of crime, and that these crimes are clustered in relatively small geographic locations within a city (Braga et al.1999; Braga et al., 2010; Weisburd et al., 2009). Given this, the problem-oriented policing literature suggests that police interventions would be most effective when they are highly focused on the people, places and the context driving the problem (Braga et al., 1999; Kennedy, 1998; Sherman & Weisburd, 1995). This allows police attention to be focused on a specific crime problem (e.g. gun violence, gang violence, drug markets) and the individuals that are driving that problem. For example, Indianapolis and Rochester targeted gun violence (Indianapolis specifically focused on firearm homicides) focusing on high risk probationers and parolees (Klofas et al., 2007; McGarrell et al., 2006); while Chicago focused on gun violence but specifically targeted convicted felons (Papachristos, Meares, & Fagen, 2007). High Point, Nashville, Rockford, and Peoria targeted open-air drug markets focusing on low level street dealers (Corsaro &Brunson, 2013; Corsaro, Brunson, & McGarrell, 2010; Frabutt, et al., 2009; Hipple, Corsaro, & McGarrell, 2010).

Multi-agency Working Group

The focused deterrence strategies also employs a problem-oriented policing approach by encouraging law enforcement agencies to work in collaboration with the community to develop proactive responses to crime problems. The introduction of a multi-agency working group, which includes local and federal law enforcement and prosecutors, allow a wide range of sanctions to be imposed on the targeted offenders. According to Kennedy (1997), because these offenders commit crimes so often they leave themselves vulnerable to a number of legal

sanctions. Law enforcement agencies look to exploit the criminal records of these individuals by coordinating to create consequences, by pulling every "lever" legally available, for individuals or groups involved in crime (Braga et al., 2001; McGarrell et al., 2006; Tillyer et al., 2010). These levers may include serving outstanding warrants or strictly enforcing their probation, basically disrupting any criminal activity they may be involved in. This multi-agency group helps ensure that a variety of sanctions can be used against these chronic offenders.

Deterrence Message

A defining feature of the focused deterrence strategy is the direct communication of the strategy and threat of sanctions to the target population – those at risk for violent offending and victimization. The small group of targeted offenders are directly confronted with a deterrence message and told that their offending will not be tolerated. The strategy involves explicit communication (typically in a group setting) to a specific group of chronic and habitual offenders that have been identified by police and prosecutors (Hipple, Corsaro, & McGarrell, 2010). This component of the strategy involves key criminal justice officials (i.e., police, prosecutors, probation and parole officers) warning the targeted offenders that continued criminal behavior will result in the harshest possible legal sanctions (employed by the multi-agency working group) (Kennedy, 1998). At the same time, they are offered help in the form of social services for those who want to stop the behaviors that put them at risk for offending (McGarrell et al., 2006; Tillyer et al., 2010). Essentially, law enforcement makes it known to the offenders that they are ready to "take out" anyone that engages in violence and help is available to those who want it.

Call-in and Community and Family Involvement

Interventions using the focused deterrence strategy have used a number of methods to deliver the deterrence message to the targeted offenders: through probation or parole officers, meetings with inmates in prison, and contact through gang outreach workers, members of the clergy, or radio bulletins. For example, in Minneapolis they delivered the message to gang involved victims in hospitals. However, the most common method of delivery is through call-in or offender notification meetings. For these meetings, groups of targeted offenders are invited or required to show up at a designated place (e.g., courtroom, church, community center, police station, etc.) at a certain time. Meetings generally follow a common format: representatives from law enforcement speak about the purpose of the program (e.g., violent behavior will not be tolerated and will invoke an immediate and intense response), then representatives from the community speak about the impact of violence or crime on the community at large, and finally social service representatives detail program options for those who want to change their behavior. Family and friends of the targeted offenders are also invited to the meetings to provide support for the individuals.

The addition of community impact statements and the presence of the offender's family and friends are meant to serve as a form of deterrence. The central element of the call-in process is the community, family, and loved ones of the offenders telling them that they need to stop their behavior (Kennedy, 1998; Kennedy & Wong, 2009). In their meta-analysis of focused deterrence strategies Braga and Weisburd (2012) suggested that family members and community members in the interventions are powerful informal social controls for the offenders. In High Point, they operated on the premise that "…dealers would stop selling drugs when people around them made it clear they should…" leading them to identify "influentials" to invite to the call-in

meetings; "…the hope was to enlist those close to the offenders – parents, grandparents, guardians, older members of the communities, ministers, ex-offenders – to create and reinforce positive norms and expectations" (Kennedy & Wong, 2009, pg. 23).

Social Services

As noted above, in addition to the message that violence will no longer be tolerated by law enforcement or the community, help is also offered to the targeted offenders in the form of social services (e.g. job training, housing, mentoring, GED classes, housing assistance, parenting assistance and substance abuse treatment) (Kennedy, 1997; Kennedy & Wong, 2009). As a complement to the law enforcement efforts, social services and community resources are used as a way to reintegrate the targeted offenders into the community (Kennedy, 1997; Rivers, Norris, & McGarrell, 2012). The targeted offenders are given an opportunity to use social services to help improve their situation, however if they continue to engage in violence, along with the legal sanctions they will incur, the social service opportunities may also be taken away. According to Williams and Hawkins (1986) this potential loss of legitimate opportunities can be a deterrent to committing crime. Individuals may refrain from offending, not because of the legal sanctions (e.g. jail), but because they do not want to risk losing a job or risk potentially not getting a job. The use of these social services can be viewed as a legitimate opportunity (to cultivate vocational skills or get an education) for these offenders, opportunities that they may have never had access to before (Rivers, Norris, & McGarrell, 2012).

There is considerable variation in the nature and extent of services available across intervention sites. Some programs offered direct services to offenders while others like Winston-Salem, High Point, Providence and Cincinnati had resource coordinators and case management

systems to assist offenders. Although the use of social services by the targeted offenders in these programs have not typically been well documented, a study by Engel et al (2011) of the Cincinnati Initiative to Reduce Violence (CIRV) provided a detailed description of their social service model and examined its impact on the decline found in group member involved homicide and gun violence incidents. Their analysis indicated that the social services did not have an impact on the reduction in violence. However, they suggest this outcome may be due, in part, to the social service program not being achieved as expected; less half of the clients that enrolled in the social service program were those specifically targeted by law enforcement for CIRV (22 percent) and of the clients that were enrolled less than nine percent actively engaged in the programs.

Follow-up and Enforcement Consequences

In the deterrence messages communicated to the offenders, a number of sanctions (levers) are used to try to deter individuals from offending, such as parole and probation checks, warrant enforcement, saturated patrol, increased prosecutorial attention (e.g., being prosecuted federally), disruption of drug markets, and housing and property code enforcement (Kennedy, 1997). The success of a focused deterrence strategy can depend on whether or not the threats that are made regarding law enforcement follow-ups are kept. Studies detail *intended* consequence but they rarely have details of the *actual* consequences offenders faced if they were not deterred by the message and continued to offend. Studies that have provided details on actual consequences have described successful and unsuccessful efforts to enforce the deterrent message. In High Point, offenders who attended call-ins were flagged in the police record management system and any subsequent drug dealing resulted in immediate arrest. In Boston, Minneapolis, and Chicago they performed crackdowns on gangs that continued to commit

violent crimes. These crackdowns gave credibility to the deterrence message (Kennedy, 1997). Winston-Salem, however, had difficulty enforcing the promised consequences especially in the case of minors. Judges were reluctant to impose harsh penalties for anything but the most serious cases, so prosecution efforts were not successful.

Although studies have found focused deterrence strategies to be successful across crime types and sites, the outcomes are primarily at the community level. As shown above, a number of components in these strategies are aimed at deterring offenders specifically selected for increased attention by program officials, yet little is known about the outcomes of these offenders. Given that these components are geared toward influencing the behavior of the targeted offenders, an examination of offender outcomes is needed to determine the effectiveness of focused deterrence at the individual level.

CHAPTER 3: DETERRENCE THEORY AND PROCEDURAL JUSTICE

To explore the relationship between involvement in a focused deterrence strategy and reoffending by the targeted offenders, deterrence theory and procedural justice will be explored.

Deterrence Theory

Deterrence is the practice of employing threats of punishment to influence an individual's behavior. The effectiveness of deterrence rests on the assumption that people have free will, act in a rational manner and choose actions that result in the greatest pleasure and the least pain (Brown & Esbensen, 1988; Paternoster, 2010). It is assumed that people will be deterred from crime if the costs associated with punishment outweigh the pleasure associated with crime. Rational individuals are capable of making decisions in a logical, calculating fashion, taking into account the costs and benefits of alternative courses of action. This is based on Jeremy Bentham's idea of hedonic calculus. He believed that individuals acted as human calculators, weighing the probability of present and future pleasures against present and future pain. They then determine a course of action based on these calculations (Paternoster, 2010). Having free will enables people to act as they choose and because they are hedonistic, their final decision is based on the desire to maximize pleasure and minimize pain (Brown & Esbensen, 1988).

Most of the literature on deterrence focuses on the effect of changing the certainty, swiftness, and severity of punishment associated with certain acts on the prevalence of crime (Nagin, 1998; Paternoster, 1987). First, certainty refers to the probability of experiencing punishment, such as the chance of being arrested, prosecuted, convicted, and sentenced. As the perceived certainty of punishment increases, the probability of criminal behavior decreases. Second, swiftness refers to the length of time that elapses between the crime and the punishment.

As the response to punishment becomes swifter, the probability of criminal behavior declines. Finally, severity is the amount of punishment that is necessary to make it more painful for the offender than the pleasure gained from the crime (Brown & Esbensen, 1988). Certainty and swiftness are seen as more important than severity. Research has found certainty and swiftness to have a modest deterrent effect on crime, while most studies suggest that changes in the severity of punishment have little to no effect on crime (Matsueda et al, 2006; Nagin, 1998; Nagin & Paternoster, 1993; Paternoster, 1987).

Scholars argue that crime is no different than other behavior and criminals are no different than non-criminals, what differs are people's assessment of the costs and benefits of an action (Paternoster, 2010). Since everyone is motivated by self-interest, everyone has the capacity to commit crime when the benefits exceed the costs. Becker argued that crime occurred due to rational self-interest and could be understood like any other kind of economic activity,

> "a person commits an offense if the expected utility to them exceeds the utility he could get by using his time and other resources at other activities…Some persons become "criminals," therefore, not because their basic motivation differs from that of other persons, but because their benefits and costs differ" (as quoted by Paternoster, 2010; pg. 776)[2].

He argued that the decision to offend is made up of the costs and benefits of crime and non-crime, including the cost of formal legal punishments. If this is the case, the best way to prevent crime is through punishments that are swift, certain, and appropriately severe. Deterrence theorists focus primarily on the impact of official punishments of crime. Essentially, as an

[2] Gottfredson and Hirschi (1990) also make this point. Gottfredson and Hirschi suggested, "[al]though there will be little variability among people in their ability to see the pleasures of crime, there will be considerable variability in their ability to calculate potential pains" (1990, pg. 95).

individual's perception of the risk of being sanctioned for a crime (e.g., through fines, probation, imprisonment) increases, the likelihood that they will commit the crime should decrease (Gibbs, 1968; Piguero & Pogarsky, 2002). The belief is that these sanctions will restrain those who have been punished from committing more crimes (specific deterrence) and inhibit those who have not yet offended from committing crimes (general deterrence).

General Deterrence

Deterrence theory makes a distinction between two types of deterrence: general and specific. General deterrence refers to the idea that punishment deters offending among people in the general population, those not specifically punished for a crime. Early deterrence research was based upon aggregate-level data in which certainty and severity of punishment at the state level was correlated with official crime rates. These studies mostly used secondary data and certainty was generally measured as the aggregate risk of arrest or imprisonment for a particular crime, while severity of punishment was measured in terms of average length of sentence (Paternoster, 1987). Studies focusing on aggregate analyses examined the effect of targeted and specific policy interventions such as an increase in prison sentences (severity) or an increase in the number of police (certainty), and estimated deterrent effects by looking at natural variations in the crime rates and sanction levels across time and space (Nagin, 1998; Paternoster, 2010). The criminal justice system is based, in part, on the expectation that having strictly enforced laws and appropriate penalties that are applied with reasonable swiftness will prevent crime by deterring offenders from reoffending and noncriminal individuals from committing crime (Paternoster, 2010).

Specific Deterrence

Specific deterrence refers to the idea that punishment reduces the risk of reoffending for those specific people who are punished. In the 1980s, scholars began to understand deterrence theory as a theory about perceptions of sanction threats and the relationship between those perceptions and offender behavior. Perceptual deterrence assumes that motivation to commit crime is affected by the perceived consequences of criminal behavior (Paternoster & Bachman, 2013). This restatement of deterrence as perceptual moved deterrence research from the macro-level to the individual or micro-level of study (Nagin, 1998; Paternoster, 1987). In the 1980s deterrence also began to expand beyond looking solely at the deterrent effect of formal sanctions to include basic expected utility propositions, family and peer influences, and moral judgments (Paternoster, 1987).

Deterrence theory typically focused on the State, and threats of fines and incarceration, as agents of social control; however, significant others in the individual's social environment play a similar role. They pose threats of potential punishment which increase the subjective cost of nonconformity (Grasmick & Bursik, 1990; Williams & Hawkins, 1986). Rather than focus solely on the deterrent effect of formal legal sanctions, informal sanctions were introduced into research. Williams and Hawkins (1986) argued that inhibition to crime could be brought about directly and indirectly, through social censure, loss of legitimate opportunities (e.g. losing job), and self-imposed costs (e.g. guilt) by the threat of legal sanctions. Studies have consistently found that informal sanctions were more responsible for inhibiting criminal conduct than fear of formal sanctions (Nagin, 1998; Paternoster, 1987; Pratt et al, 2006). Additionally, perceptual deterrence studies have consistently found that informal sanctions were a more effective deterrent than formal sanctions. Rather than fear of arrest, evidence points to the importance of

social censure from important others as a more significant factor in inhibiting crime than fear of legal consequences (Paternoster & Bachman, 2013).

Deterrence research also began to examine how perceptions of sanction threats were formed. Sanction threat perceptions are constantly modified and updated over time, and change in response to criminal behavior committed by the actor, and the consequences of that behavior (Stafford & Warr, 1993; Piquero & Pogarsky, 2002; Pogarsky et al., 2004). Facts and perceptions – like the perceived certainty of punishment – that were once salient can fade from an individual's memory, and the new information they continuously acquire can prompt them to revise their perceptions (Pagrasky et al., 2004). Studies examining how offending experiences and their consequences affect sanction threat perceptions have found that individuals update their sanction risk estimates in response to new information (Paternoster et al., 1995; Piquero & Pogarsky, 2002; Pogarsky et al., 2004). For example, Paternoster et al. (1995) conducted a two-wave panel study on the effects of involvement in petty theft and bad check writing on perceptions of the certainty of being sanctioned. They found that as involvement in both behaviors increased, the perceptions of sanction certainty decreased. They also found that reduction in perceived certainty was significantly related to increased involvement on both offenses and that being sanctioned between the two waves was related to an increase in perceived certainty. Similarly, Pogarsky et al. (2004) found that being arrested increases the perceived certainty of getting arrested in the future among high school students, particularly for those with low prior estimates of certainty.

Recently scholars have argued that police interventions provide an effective approach for gaining both specific and general deterrence against crime (Braga & Weisburd, 2012). Police

interventions such as problem-oriented policing and place-based policing target small areas where crime is concentrated, individuals in those areas that are committing the crimes, and/or the situations that perpetuate those crimes, with the expectation that they will decrease the crime rate through deterring offenders and would be offenders.

In place-based policing, places are important for understanding and controlling crime and emphasis is placed on reducing opportunities for crime at places, not simply reacting to crime after it occurs; it shifts focus from the people involved in crime to the contexts of criminal behavior (Weisburd, 2008; Weisburd et al., 2009). According to Weisburd (2008) place-based policing is more efficient than focusing on only targeted individuals, provides more stable targets for police than individual offending patterns, and has a strong evidence base. In this context, places are considered small micro units of analysis like buildings, addresses, blocks, and street segments or clusters of addresses; and crimes concentrated at these places are referred to as hot spots (Braga et al., 2010; Weisburd, 2008; Weisburd et al., 2009). Studies have shown that crime is generally clustered in micro places, which generate a disproportionate amount of criminal events in a city, and the high concentration of crime at these micro places has been found to be stable over long periods of time. For example, Braga et al. (2010) found that Boston gun violence was concentrated at a small number of street segments rather than spread across the city and that the micro places with volatile concentrations of gun assaults over time represented less than three percent of street segments and intersections but generated more than half of all gun violence incidents.

Similarly, Weisburd et al. (2009) assessed the extent to which juvenile crime is concentrated at hot spots and assessed the stability and variability of crime at street segments. They found that juvenile crime was strongly concentrated at hot spots and that a high rate of juvenile crime

remained relatively stable at street segments across a 14 year time period. A study conducted by Groff et al. (2010) went further and showed that even street segments right next to each other tend to have very different levels and patterns of crime over time. This shows the importance of focusing on micro places because blocks and street segments in the same neighborhood could have very different levels of crime, which could not be captured by just examining crime at the neighborhood level. The National Research Council's review of police practices and policies studies found that when resources were focused on crime hot spots they showed strong evidence of police effectiveness (Weisburd, 2008).

Deterrence Theory and Focused Deterrence

Focused deterrence utilizes core deterrence ideas, attempting to increase the certainty, swiftness, and severity of punishment associated with committing crime, by increasing the risks offenders face in new ways, such as, communicating incentives and sanctions directly to targeted offenders (Braga & Weisburd, 2012). Focused deterrence strategies also look to capitalize on the recent scholarship which argues that police interventions provide an effective approach for gaining both specific and general deterrence against crime (Braga & Weisburd, 2012). This approach incorporates focusing on micro places while also targeting the specific individuals in those places that are driving the problem. The following section discusses how certain components of the focused deterrence strategy are directed at core deterrence ideas.

Targeted Population and Multi-agency Working Group

The specialized attention on the targeted offenders should increase the certainty of getting arrested and sanctioned if they engage in the targeted criminal activity. The introduction of a multi-agency work group and the wide range of sanctions they are able to employ to persuade offenders to cease their behavior also serves as a way to increase the certainty and severity of the

sanctions for committing the targeted behavior. Law enforcement agencies are able to exploit the criminal records of these individuals by serving outstanding warrants or by strictly enforcing their probation; disrupting any criminal activity they may be involved in. Federal involvement in these multi-agency work groups also increases the possibility of severe sanctions for certain behaviors (Kennedy, 1997). The harsh penalties imposed on similarly charged persons are also used as proof regarding the seriousness of the message and the certainty of a criminal justice response (Corsaro, Brunson, & McGarrell, 2010). With the increased perceived certainty offered by targeting a specific population and the increased perceived severity gained by using a multi-agency working group, theory suggests that the targeted offenders would be deterred from reoffending.

Deterrence Message, Follow-up and Enforcement Consequences

Deterrence scholars argue that sanction threat perceptions are constantly modified and updated over time. Individuals change their criminal behavior in response to the consequences that are incurred (or not) by their behavior (Nagin, 1998; Piquero & Pogarsky, 2002; Pogarsky et al., 2004), therefore, it is important that the threats laid out in the deterrence messages are carried out by program officials. It is also important that the deterrence message is continually communicated to the offenders. Theory suggests that facts and perceptions, like the thought of being watched and/or sanctioned, that were once salient in an individual's mind can fade from memory over time, and that newly acquired information can prompt individuals to revise their perceptions (Pagrasky et al., 2004). According to McGarrell and colleagues (2006) the direct communication of the deterrence message to the targeted offenders in the offender notification meetings and the knowledge of the follow-up consequences are the types of new information that may cause offenders to reassess the risk of continuing to commit crime. Therefore, the

effectiveness of the deterrence message for the targeted population depends on how well the cause and effect consequences are communicated to them. If threats are enforced and the deterrence message is continually communicated to the targeted offenders they should be deterred from committing the prohibited offense.

Overall, the basic premise of the focused deterrence approach involves enhancing the threat of criminal sanctions for the highest risk offenders and directly communicating that threat to them, in an attempt to deter the targeted offenders. Deterrence theory posits that the deterrent effect for these offenders will be determined by their perceptions of risk and uncertainty. By increasing the threat of sanctions for those most likely to be involved in committing crimes in the targeted area and increasing the perceived likelihood, severity, and swiftness of the sanctions, it is expected that the offenders' perceptions of risk will be altered and they will be deterred from offending (Kennedy, 1998; McGarrell et al., 2006).

Procedural Justice Theory

Deterrence theory assumes that individuals obey the law because they fear the consequences of failing to do so. Other theories recognize that certain circumstances such as criminal justice processes also influence individual behavior. Procedural justice focuses on the way individuals make judgments about the fairness and outcome of a process through their interactions with others during that process. In criminal justice, the focus is the subjective sense of being treated fairly and with respect by law enforcement officials (Tyler, 2006). Scholars argue that compliance with the law stems from an individual's belief that the law is just and/or the authority enforcing the law has the right to do so (Tyler, 1990). The key issue is not necessarily whether sanctions are applied; rather, the individual's view of the sanctions fairness,

and the legitimacy of the procedures through which law enforcement exercise their authority (Tyler, 2003).

Studies of procedural justice in criminal justice began in 1990 with Tyler's, *Why people obey the law*. Since then research on procedural justice has grown, with studies exploring its effect on public cooperation and compliance with the police. This research has consistently found strong associations between procedural justice, perceptions of police legitimacy, self-reported cooperation with police, and satisfaction with the process (Tyler, 2006). In 2005, Tyler's study on ethnic group differences in trust in the police found that trust in the police was strongly influenced by perceptions about the fairness of the procedures police follow when exerting their authority. He also found that this trust, or lack of trust, was related to an individual's willingness to cooperate with the police (also see Hinds & Murphy, 2007; Murphy, Hinds, & Fleming, 2008; Tyler, Schulhofer, & Huq, 2010). Similarly, positive and negative interactions with the police also influence an individual's perception of law enforcement. Skogan (2006) examined people's outcome experiences (positive and negative) with the police on their general confidence in the police. He found that negative outcomes, such as arrest, that were also perceived as unfair, led to negative perceptions of police legitimacy and less of a willingness to cooperate with police. However, negative outcomes that were perceived as fair had no impact on perceptions of police legitimacy and cooperation. This suggests that procedural justice and perceptions of fairness are especially important when interacting with individuals during negative experiences (e.g., arrest, sentencing).

If offenders targeted for participation in the focused deterrence strategies judge the process and law enforcement authorities to be fair and just, they will be more likely to comply with program rules than if they found the process unfair. According to Tyler (2003), if there is a

sense of fairness in the procedures, individuals may feel a sense of obligation to comply with the law. Although program participants are told they will incur harsher sanctions if they continue to offend, they are also given a second chance and offered services; elements that could lead to a greater sense of procedural justice and subsequently a decreased likelihood of reoffending.

CHAPTER 4: METHODOLOGY

As shown in Chapter 2, focused deterrence strategies contain a number of components geared toward influencing the behavior of offenders targeted for involvement in interventions that use the approach. Despite these targeted attempts to influence behavior, only Chermak's (2008) study on the Indianapolis Lever-Pulling experiment and Papachristos et al. (2013) study on PSN Chicago's offender notification forums have examined the outcomes for these individuals. The current study adds to the existing body of literature by providing another examination of the individual-level effects of an intervention that uses a focused deterrence approach. Specifically, this study examines the rate of re-arrest and time to re-arrest for low-level drug dealers (i.e., B-listers) involved in the Drug Market Intervention (DMI) three years post-intervention. Generally, criminal justice policies rely on formal sanctions such as arrest and imprisonment to deter offenders. However, punishments for low-level drug dealers are rarely severe (e.g., probation or fines) or swift, leading to chronic offending for these individuals who know there will be no real consequences for their behavior. The DMI tries to deter these chronic offenders using a model built on the focused deterrence pulling levers concept – directly communicating a deterrence message to the small group of lower-level drug dealers involved in the drug market driving the crime problem in the area (Hipple, Corsaro, & McGarrell, 2010). Although this process uses formal sanctions such as threat of arrest and receiving the maximum possible sentence allowed for committing a prohibited offense, it also relies on informal sanctions by involving community members, family, and friends in the call-in meetings where the deterrence message is delivered, as well as offering the offenders social services.

Research Question

The main objective of this study is to determine the deterrent effect of involvement in the DMI by examining the impact of the DMI on the outcomes of the targeted offenders; therefore the study will focus on the following research question:

> Do offenders who attend a DMI call-in meeting have a lower incidence and longer time to re-arrest than offenders who experience traditional criminal justice processing?

Hypotheses

Based on the review of components of focused deterrence geared toward influencing offender behaviors in Chapter 2 and the theoretical explanations presented in Chapter 3, the following outcomes are expected:

1) Offenders who attend a DMI call-in meeting will have a lower incidence of re-offending than those of an equivalent comparison group.
2) Offenders who attend a DMI call-in meeting will have a longer time to re-arrest (time-to-failure) than an equivalent comparison group.

The Data

Data for this study were obtained from the High Point Police Department in North Carolina, which implemented the Drug Market Intervention. In 2003, in response to high levels of open-air drug activity and poor police/community relations, the High Point Police Department, in conjunction with a multi-agency working group, developed and implemented a strategy to eliminate overt open-air drug markets throughout the city. This strategy consisted of first identifying a narrowly defined target area through a data-driven process. This was the area with the highest level of drug-related crime and violence. Next, they identified the street-level drug dealers in that area. Law enforcement documented criminal cases against these drug

dealers through buys by undercover officers or confidential informants that were audio or video taped. The cases built against the low-level non-violent dealers, (known as B-listers) were held (i.e., banked or not filed with the prosecutor's office) and these individuals were invited to attend a call-in. Dealers that were violent (had violent records or gun charges) or those with a probation or parole violation were immediately arrested and prosecuted. These were known as the A-listers and were used to set an example for the B-listers of what could happen if they continued to deal drugs. The call-ins were held at High Point police headquarters. During the call-in, law enforcement, community members, and service providers communicated to the B-listers that violence and drug dealing would no longer be tolerated. If they continued to deal drugs or committed certain prohibited behaviors[3] they would be arrested immediately and prosecuted to the fullest extent (which includes the original banked charges), however, if they stopped dealing, nothing would happen to them.

Through a review process, law enforcement also identified what they called "influentials" and invited them to the call-in. Influentials were individuals close to the offender (e.g., parents, grandparents, peers) who program officials felt could be a positive influence and hoped could help them stop offending. Services in the form of job training, housing, transportation, substance abuse counseling, and educational programs were also offered to individuals who attended the call-in meetings. High Point Communities Against Violence[4]

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[3] There were certain offenses that were prohibited for these offenders. If they committed the prohibited offenses then they would incur the sanctions laid out by DMI officials. See Appendix A for a list of prohibited offenses.

[4] High Point Communities Against Violence is a community group of service providers, health care workers, ministers, and educators designed to provide DMI participants with basic services and resources. These resources included assistance with employment, transportation, substance treatment, housing, and enrolling in educational courses.

coordinates the social service resources for the DMI. After the call-in, street officers and detectives patrolled the targeted area to make sure the targeted offenders (B-listers) were not dealing. In the targeted areas "regular patrol officers developed a permanent strategy that included maintaining systematic contact with notified offenders, their families, and the community" to make sure that the message stuck (Kennedy & Wong, 2009, pg.19). High Point implemented the DMI strategy in five target areas over a six-year period: West End in May of 2004, Daniel Brooks in April of 2005, Southside in June of 2006, East Central in August of 2007, and Washington Drive in February of 2010.

Criminal history data were collected from arrest records provided by the High Point Police Department. These data were collected for all subjects three years pre-and post-intervention. The data include demographics such as race, sex, and age at time of initiating offense, along with number of arrests, type, and dates of arrests post-intervention. Criminal history data were used to develop the control group for this study (see Sample below). They were also used to measure the outcome variables: incidence of re-offending and time-to-failure (i.e., time to re-arrest after the date of the call-in meeting). Corrections data from the North Carolina Department of Public Safety was used to determine actual time at risk for re-arrest by accounting for time incarcerated during the study period.

Sample

The sample for this study consists of two groups, a treatment group and a comparison group. The treatment group included all individuals who attended a call-in meeting during each round of the DMI (i.e., B-listers). DMI officials selected dealers for call-in meetings based on certain criteria. First, dealers were identified through a review process. Then dealers had to be caught selling drugs to an undercover officer or informant. The multi-agency working group

then reviewed the offenders' records and offenders with violent records, gun charges, or probation and parole violation were excluded and became A-listers. The remaining offenders became B-listers and were invited to attend a call-in meeting (n=81). The comparison group consists of a matched group of offenders arrested for selling drugs or possession with intent to sell drugs within one month before or after a call-in (n=162). The procedure for developing the comparison group is described below.

Comparison Group – Propensity Score Matching

The comparison group was constructed using a propensity score-matching method. One of the benefits of estimating causal effects using randomized experiments is "that the treated and comparison groups are guaranteed to be only randomly different from one another on all background covariates, both observed and unobserved" (Stuart, 2010, pg 1). When comparing a treatment group with a nonexperimental comparison group to estimate the causal effect of a treatment, self-selection problems or systematic bias in the selection of units assigned to the treatment group could influence the effects (Cook & Campbell, 1979). Therefore, when estimating causal effects using observational data it is best to emulate a randomized experiment as closely as possible by obtaining treatment and control groups with similar covariate distributions. Choosing well-matched treatment and control groups will reduce the bias that may occur due to the covariates (Stuart, 2010). This is done by using a procedure known as matching, a technique that attempts to identify, for each individual in the treatment group, at least one individual in the comparison group that "looks like" the treated individual based on some set of observational characteristics (Apel & Sweeten, 2010).

The matching method used in the current study is propensity score matching. This method offers a way to select a subsample of treated and untreated individuals that are similar (Apel & Sweeten, 2010). A propensity score is the probability of being assigned to the treatment group given a set of observed pretreatment covariates. Once propensity scores are found for individuals in the treatment group and individuals in the comparison group, subjects from those groups are matched based on the value of their propensity scores. Propensity scores are essentially balancing scores, "at each value of the propensity score, the distribution of the covariates defining the propensity score is the same in the treated and comparison groups. Thus, grouping individuals with similar propensity scores replicates a mini-randomized experiment, at least with respect to the observed covariates" (Stuart, 2010, pg. 6). Propensity scores also allow construction of matched sets with similar distributions of covariates without requiring close or exact matches on all individual variables (Rosenbaum & Rubin, 1983). Propensity score matching is a widely accepted method for adjusting for existing group differences to create an equivalent comparison group, therefore this statistical technique is suitable for determining the best comparison matches for the DMI participants in the treatment group (Freedman & Berk, 2008).

Given that the treatment group for this study consisted of individuals caught selling drugs to undercover agents, the comparison group was drawn from pools of offenders that were arrested for a drug offense in High Point within a month before or after each call-in[5] (n= 1370). That offense will be the referred to as the "initiating offense" for the comparison group. The

[5] The range of dates for each pool were: West End April 18, 2004 - June 18, 2004; Daniel Brooks March 5, 2005 – May 5, 2005; Southside May 8, 2006 – July 8, 2006; East Central July 14, 2007 – September 14, 2007; and Washington Drive January 9, 2010 – March 9, 2010.

pool of offenders was refined by excluding individuals arrested for mere possession of drugs or drug paraphernalia for their initiating offense since this would not rise to the level of seriousness needed to come to the attention of DMI officials. Individuals charged with violent offenses or possession of a firearm at the same time as the initiating offense or that had prior weapons charges were also excluded from the pool because they would not have met the criteria for inclusion as a B-lister[6]. After excluding these individuals, 211 offenders were available for inclusion in the matching procedure.

There are several key steps when conducting propensity score matching: 1) determining variables to include for matching, 2) estimating the propensity score, 3) implementing a matching method, and 4) assessing the quality of the resulting matched samples by demonstrating balance.

Inclusion Variables. To begin, a propensity score model is developed which includes variables that potentially confound the relationship between treatment status and the outcome. A confounding variable is a variable that is associated with both treatment selection and the outcome, when unaccounted for, these variables can affect the ability to make causal inferences about the effect of the treatment on the outcome (i.e., the effect of DMI on re-arrest) (Apel & Sweeten, 2010; Lanza, Moore, & Butera, 2013). It is important to include all variables known to be related to treatment assignment and related to the outcome in the propensity score model (Rubin & Thomas, 1996; Stuart, 2010). It is also acceptable to include variables that are not related to treatment because they will have little influence on the propensity score model.

[6] Could not account for probation and parole violations at the time of initiating offense.

Therefore according to Stuart (2010), when possible, researchers should be liberal in including variables that may be associated with treatment assignment or the outcome. The goal is to model non-random elements of being selected for treatment using observed information on potential confounders (Apel & Sweeten, 2010). However, it may not always be possible to include a large number of variables, in those cases; Stuart (2010) says priority should be given to variables thought to be related to the outcome. The variables included in this model were: age at time of initiating offense, sex, race, age at first offense, type of first offense (violent, property, drug, other), previous number of arrests, and the most common type of previous arrest (violent, property, drug, other).[7]

***Propensity Score Estimation*.** Once the covariates were identified the propensity scores were estimated. The propensity score is defined as the probability of receiving treatment conditional on a set of observed pretreatment covariates:

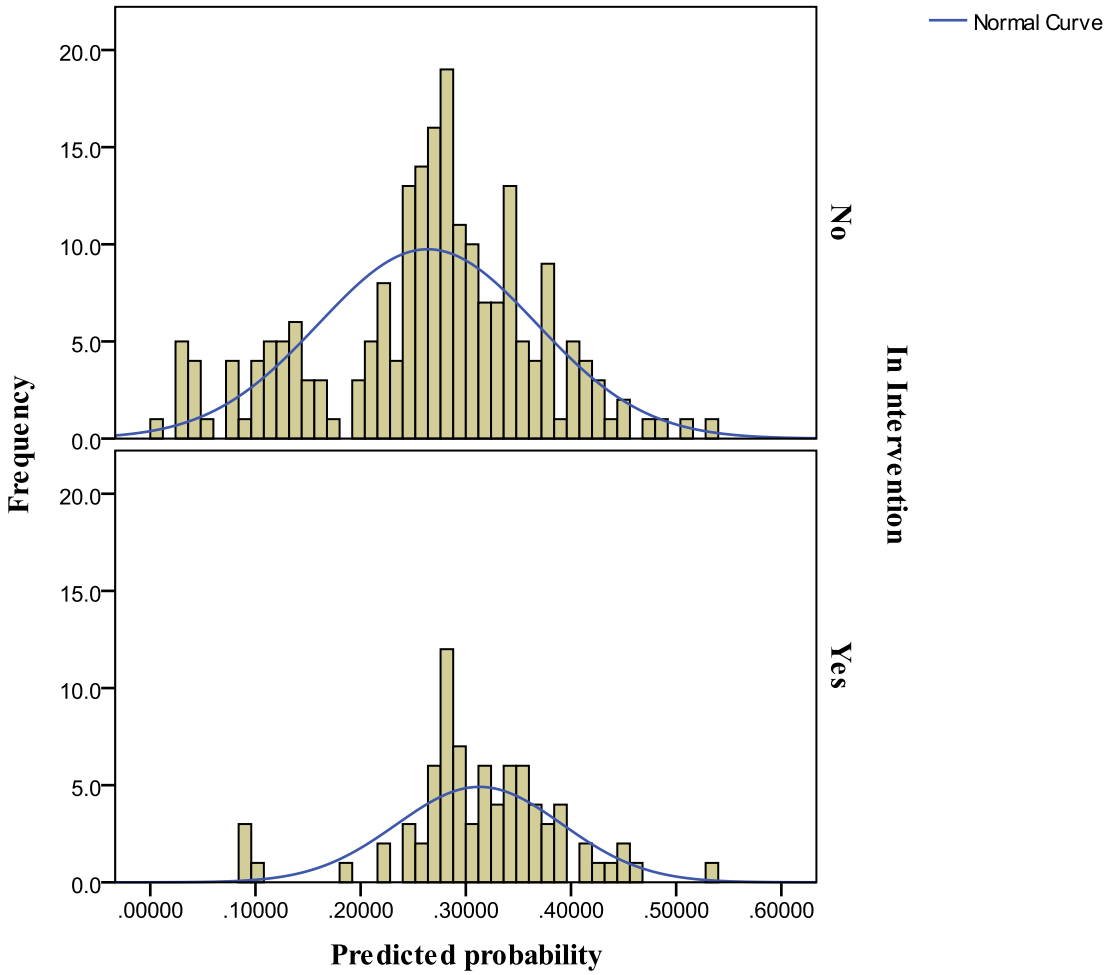
$$P(x) = \Pr(T = 1 \mid \mathbf{X} = \mathbf{x})$$

where for each individual whose pretreatment covariates, X, have observed values X=x, Pr is probability and T is a binary indicator that takes values 1 for treatment and 0 for comparison. Any model relating a binary variable (i.e., the treatment assignment) to a set of predictors can be used to estimate propensity scores, which is the predicted probability of receiving treatment (Stuart, 2010). In the current study, the propensity scores (predicted probability of being selected for DMI) were obtained using logistic regression. After propensity scores are obtained it is important to assess common support between the treatment and

[7] Models with different variations of variables were also tested; this model yielded the best results.

comparison individuals to determine if matching is possible. Common support occurs when the distribution of propensity scores for the treatment and comparison individuals overlap (Apel & Sweeten, 2010; Lanza, Moore, & Butera, 2013). Figure 1 shows the histograms of the propensity score distributions for the treatment and comparison group. The histograms indicate considerable overlap of propensity scores, meaning for nearly all DMI participants (treatment group) there is an individual in the comparison group with a similar propensity score to match on.

Figure 1. Histograms of Propesity Scores: DMI vs Comparison



Histograms showing overlap of propensity score distributions for treated (DMI) versus comparison individuals.

***Matching*.** After estimation of the propensity scores, matching is performed to construct equivalent groups. When there are a large number of comparison individuals compared to the number of treatment individuals it is possible to get multiple good matches for each individual in the treatment group, therefore a 2:1 nearest neighbor matching (ratio matching) method is used.[8] Each treated individual is matched with two comparison individuals who have similar estimated propensity scores (Stuart, 2010). Individuals in the treatment group are randomly sorted and then the first individual from the treatment group is matched with the two individuals from the comparison group who have the closest propensity score estimates. Once the matches are made they are set aside. This process continues until each individual in the treatment group is matched to two comparison individuals. Any comparison individuals not matched are discarded.[9] This method involves a trade-off between variance and bias. Bias increases because on average, poorer matches may occur since the second closet match for each treated individual is further away (i.e., the propensity scores are not as close) than their first closest match. However, using multiple matches reduces variance because there is a larger matched sample size (Stuart, 2010). A caliper of .2 standard deviations of the logit of the propensity score was imposed to improve matches made on the estimated propensity scores. A caliper is the maximum distance a treated and comparison individual can be apart on their propensity score in order to be matched. Having a small caliper will result in better matches on the propensity score because they are more

[8] According to Caliendo and Kopeinig (2005) when using oversampling one must decide how many matched partners should be chosen for each treated individual. Since the number of comparison offenders available to be included in the matching procedure was 211 a 2:1 method was used. This allowed every treatment individual to have the same number of comparison matches.

[9] Matching was done using the program "psmatching3" in SPSS via an SPSS R-Plugin.

similar, therefore likely resulting in better balance on the covariates. The procedure produced 162 matched individuals for the comparison group.

Assessing Balance. After matching, tests were performed to assess the quality of the resulting matched groups. The goal of matching is to get the best possible balance between the treatment and comparison groups on the pretreatment covariates (i.e., confounders) (Apel & Sweeten, 2010; Lanza, Moore, & Butera, 2013; Stuart, 2010). A demonstration of balance makes a stronger case for assuming that treatment is "as good as randomly assigned," between the groups, at least with respect to the variables included in the propensity score (Apel & Sweeten, 2010). Balance was assessed by comparing different statistics for the treatment and comparison group pre- and post- matching. First, a t-test (continuous variables) and Chi square test (categorical variables) were used to determine whether there were statistically significant differences between the treatment and comparison group on the pretreatment covariates. Before matching, differences are expected, but after matching, imbalance should be reduced. Second, one of the most common techniques for assessing balance, the standardized mean differences (standardized bias), is examined pre- and post- matching. The standardized mean differences are similar to an effect size (e.g., Cohen's *d*), therefore the treatment and comparison groups are considered balanced on the covariates if their standardized mean differences are less than the absolute value of 0.25 after matching (Apel & Sweeten, 2010; Lanza, Moore, & Butera, 2013). Table 1 presents the differences and standardized mean differences between the treatment (DMI participants) and comparison group on each covariate included in the propensity score model as well as pretreatment covariates not included in the propensity score model pre-and post matching. Even before matching, the treatment and comparison groups were not statistically different on the observed covariates and the standardized mean differences showed that most

covariates were balanced, with the exception of race, number of arrests, number of drug arrests, age at first arrest, and age at first drug arrest. After matching the groups were balanced on all covariates.

Table 1. Balancing Tests for Propensity Scores: Means and Standardized Mean Difference

	Before Matching			After Matching		St. Mean Difference	
	DMI (n=81)	Control (n=211)		Control (n=162)			
Variable	Mean (SD) /n(%)	Mean (SD) /n(%)	*P* value	Mean (SD) /n(%)	*P* value	Before	After
Age	27.6(9.3)	27.0(8.8)	.629	27.0 (8.8)	.659	.06	.06
Sex			.959		.883	-.01	-.02
Male	72(88.9)	188(89.1)		145(89.5)			
Female	9(11.1)	23(10.9)		17(10.5)			
Race			.069		.209	-.53	-.23
Black	79(97.5)	188(89.1)		152(93.8)			
White	2(2.5)	23(10.9)		10(6.2)			
First arrest type			.100		.724	-.03	-.10
Violent	3(3.7)	9(4.3)		9(5.9)			
Drug	19(23.5)	32(15.2)		27(16.7)			
Property	13(16.0)	32(15.2)		25(15.4)			
Other	43(53.1)	109(51.7)		93(57.4)			
No arrests	3(3.7)	29(13.7)		8(4.9)			
# Arrests	11.0(8.4)	8.8(8.6)	.046	9.9(8.6)	.317	.27	.14
# violent arrests	0.6(0.8)	0.4(0.9)	.282	0.5(0.9)	.699	.15	.06
# drug arrests	2.6(2.6)	1.8(2.5)	.017	2.2(2.7)	.193	.31	.18
# property arrests	1.1(1.7)	1.2(2.0)	.890	1.2(1.8)	.858		
Most common arrest			.005		.240	.17	.13
Violent	11(13.6)	16(7.6)		15(9.3)			
Drug	49(60.5)	91(43.1)		81(50.0)			
Property	14(17.3)	55(26.1)		43(26.5)			
Other	4(4.9)	20(9.1)		15(9.3)			
No arrest	3(3.7)	29(14.1)		8(4.9)			
Age 1st arrest	20.7(8.9)	17.6(10.3)	.018	19.6(8.7)	.355	.34	.12
Age 1st drug arrest	17.9(11.4)	13.7(13.0)	.011	15.5(12.8)	.151	.37	.21

Note: T-test (continuous variables) and Chi square (categorical variables) were used to test significance. Means and standard deviations are displayed for continuous variables and count and frequency for categorical variables.

Research Variables

Dependent Variables

The primary outcomes of interest are incidence of re-arrest and time-to-failure (re-arrest) for any prohibited offense three years after the intervention. Included in the prohibited offenses are UCR Part I crimes, weapons offenses, assault on law enforcement officers, and possession with the intent to sell drugs or higher (see Appendix A for a full list of prohibited offenses). Incidence of re-arrest and time-to-failure will also be examined for any offense and any drug offense. ***Incidence of re-arrest*** is operationalized as a dichotomous variable used to indicate whether or not offenders were re-arrested (1= re-arrested, 0 = not re-arrested). In instances where arrest records showed multiple charges for an arrest, the most serious charge was used. ***Time-to-failure*** is time in days from the call-in date for the treatment group and from the date of the initiating arrest for the comparison group, to the date of re-arrest (e.g., date of call-in subtracted from date of re-arrest).

Independent Variables

The independent variables used for this study include, participation in DMI, demographics, and time varying crime rates.

> ***Participation in DMI*** is the primary predictor variable. This is a dichotomous variable used to indicate group membership. The treatment group (DMI) is coded as 1, and the comparison group (traditional criminal justice process) is coded as 0.
>
> ***Race*** is a dichotomous variable with 0 indicating Black, and 1 indicating white.[10]

[10] Only Black and White offenders were present in the sample.

Sex is a dichotomous variable with 0 indicating female, and 1 indicating male.

Age is conceptualized as the age in years at time of the call-in date for the treatment group and age at time of initiating offense for the comparison group.

Number of Previous Arrests is a continuous variable indicating number of arrests prior to the call-in date of the treatment group and initiating offense for the comparison group.

Most Common offense is a categorical variable conceptualized as the most common type of arrest prior to the call-in date of the treatment group and initiating offense for the comparison group. Violent is coded as 1, property is coded as 2, drug is coded as 3, and other is coded as 4. Violent crimes included UCR part 1 crimes (e.g., murder, rape, robbery, aggravated assault) and violent prohibited offenses outlined by High Point PD (see Appendix A). Property crimes included UCR part 1 crimes (i.e., burglary, larceny, motor vehicle theft). Drug crimes included all crimes coded as involving drugs by High Point PD. Other included all crimes not in the previous categories.

Violent crime rate (2004-2013) is the rate of violent crimes per 1,000 residents. This will be treated as a time-varying covariate and will be calculated monthly for each DMI neighborhood.

Property crime rate (2004-2013) is the rate of property crimes per 1,000 residents. This will be treated as a time-varying covariate and will be calculated monthly for each DMI neighborhood.

Drug crime rate (2004-2013) is the rate of drug crimes per 1,000 residents. This will be treated as a time-varying covariate and will be calculated monthly for each DMI neighborhood.

Analysis Approach – Survival Analysis

To examine whether the DMI has a deterrent effect on the targeted offenders who attended the call-ins, this study utilizes survival analysis employing a continuous-time event model. Survival analysis allows for the examination of length of time to an event occurrence, with event occurrence representing an individual's transition from one state to another (Singer & Willett, 2003). There are three major features needed to conduct a survival analysis: 1) a well defined event; 2) a clear "beginning of time;" and 3) a meaningful metric for measuring time. First, the primary event for the current study is re-arrest for any prohibited offense. The prohibited offenses are those that DMI officials specifically warned program participants that, if they engaged in them, would lead to the harsh sanctions. Arrest for drug offenses and any offense will also be examined. Second, the beginning of time refers to the point in the study when all individuals in the population are at risk of experiencing the event (i.e., re-arrest) (Singer & Willett, 2003). For this study, the beginning of time for the treatment group is the date of the call-in that the individual attended; this is when their risk of being re-arrested started.[11] For the comparison group, the beginning of time starts on the date of their initiating offense.[12] Finally, since the exact day of re-arrest can be captured with the official arrest records, time to the event will be measured in days.

A major advantage of survival analysis is the ability to account for right-censored data. Right censoring occurs when an individual's time to event (re-arrest) is unknown. This may

[11] To get actual time at risk, corrections records were used to account for times during the study period that subjects were incarcerated and therefore not at risk of being re-arrested.

[12] The drug offense that made them eligible for inclusion in the control group (see section on control group for more details).

occur for two reasons: 1) some individuals may never experience the event and 2) others may experience the event but not during the study period (Singer & Willett, 2003). In this case, the time period of the study (three year or 1095 days) may end before an individual gets re-arrested for the specified offense; this does not mean that they were never re-arrested for that offense, just that they did not get re-arrested for it during the study period. In this study individuals were also censored because they became incarcerated during the study period and were no longer at risk for re-arrest. Survival analysis allows you to analyze both observed and censored cases.

Analysis Procedure

Time to event can be measured in continuous or discrete time. Continuous time is recorded in precise units (e.g., days, minutes, seconds) where as discrete time is recorded in thicker intervals (e.g., months, years, semesters) (Singer & Willett, 2003). According to Singer and Willett (2003) time should be recorded in the smallest possible unit relevant to the study. Since time for this study is measured in days, a continuous-time event model is used to analyze the data.

The first step in a survival analysis is to describe the distribution of event occurrences, whether and when events occur. To describe the distribution of continuous-time event occurrences the Kaplan-Meier estimate of the survival function and the cumulative hazard function should be examined (Singer & Willett, 2003). The Kaplan-Meier method for estimating the survivor function involves constructing time intervals so that each interval only contains one observed event time. That is, each interval will begin at one observed event time (re-arrest) and end just before the next (Singer & Willett, 2003). The estimate of the survivor function is obtained by first computing the conditional probability of event occurrence:

$$\hat{p}(t_j) = \frac{n\ envent_j}{n\ at\ risk_j}$$

where $\hat{p}(t_j)$ is the conditional probability that an individual who is at risk at the beginning of interval *j* will experience the event by the end of the interval, $n\ event_j$ is the number of individuals who experience the event during interval *j*, and $n\ at\ risk_j$ is the number of individuals at risk during the beginning of interval *j*. Once the conditional probabilities are found for each interval, the estimate of the Kaplan-Meier survivor function is constructed by multiplying the successive conditional probabilities of surviving through each interval. The survivor function is the probability that an individual will not experience the event during a given interval (i.e., the probability of surviving (not being re-arrested) past a given interval). Kaplan-Meier survival curves are plotted for the treatment and comparison group out of the estimates of the survivor curve. To determine whether the survival curves for the groups are different the log-rank and Breslow tests were used. The log-rank and Breslow tests are large sample chi-square tests which uses observed versus expected cell counts for each of the intervals to compare the survival curves (Kleinbaum & Klein, 2012). When comparing the curves, the log-rank test emphasizes events that occur later in time while the Breslow test emphasizes events that occur early in time.

Normally, the hazard function would be examined to determine the risk of an event occurring at each interval among those still at risk (i.e., the conditional probability that individual *i* will experience the event in interval *j*, given that they did not experience it in an earlier interval). However, the hazard function cannot be well estimated in a continuous-time event model, therefore the cumulative hazard function is examined. The cumulative hazard function, denoted by H(t_{ij}) assesses, "at each point in time, the *total amount of accumulated risk* that

individual *i* has faced from the beginning of time until the present" (Singer & Willett, 2003, pg. 488). By examining the changing hazard levels over time, the unique risk of experiencing an event at each particular point in time can be deduced. The cumulative hazard for any offense will be explored graphically to learn about the underlying shape of the hazard function.

For prohibited offenses and drug offenses a competing risk model was used. Competing risks arise when subjects are exposed to more than one cause of failure, and failure from one cause prevents the occurrence of the others (Lin, So, Johnson, 2012). For example, if an offender is arrested for a non prohibited offense it may prevent them from getting arrested for a prohibited offense during the study period, or affect their time at risk, leading to an underestimation of the hazard rate. Because only one event can occur first, these multiple events are said to compete (Singer & Willet, 2003). To resolve this issue the event-specific hazard function and cumulative incidence function are used. In the context of competing risks an individual can leave the risk set by experiencing the targeted event, through censoring, *or* by experiencing a competing event. The event-specific hazard function assesses the risk of experiencing a specific event, given that an individual is at risk of doing so; specifically, it is the instantaneous rate of failure due to cause *k* (competing risks) conditional on survival until time *t*. From the event-specific hazard function, the cumulative incidence function is analyzed which allows for the use of a single event time variable to analyze the cumulative probability of failure from a specific cause *k* over time. For the prohibited offenses analysis the primary event of interest will be arrest for prohibited offenses with the competing risk being any other offense.

To examine whether variation in the risk of re-arrest varies systematically with participation in the DMI a Cox regression model is used. For continuous-time event data the Cox regression model (also known as the proportional hazards model) models the cumulative

hazard as a linear function of the covariate (participation in DMI), then transforms it using the log cumulative hazard function (Singer & Willett, 2003). The Cox regression model can be written as:

$$\log \mathrm{H}(t_{ij}) = \log \mathrm{H}_0(t_j) + \beta_1 DMI_i$$

where $\log \mathrm{H}_0(t_j)$ is the general baseline log cumulative hazard function at each time interval (this represents the value of the outcome when DMI is set at 0), and β_1 (the parameter associated with DMI) measures the size of the vertical displacement (or the constant shift per unit difference in the value). When the model is extended to include multiple predictors it can be written as:

$$\log \mathrm{H}(t_{ij}) = \log \mathrm{H}_0(t_j) + [\beta_1 X_{1ij} + \beta_2 X_{2ij} + \cdots + \beta_P X_{Pij}]$$

where $\log \mathrm{H}_0(t_j)$ is the general baseline log cumulative hazard function at each time interval (this represents the value of the outcome when the predictors are set at 0), X_1 through X_P represents the predictors, and β measures the predictors of the log cumulative hazard.

CHAPTER 5: RESULTS

This chapter begins by presenting descriptive statistics for the sample and then examining the effects of DMI on re-arrest for prohibited offenses, drug offenses, and any offense after three years. Time-to-failure (i.e., re-arrest) is then analyzed for the DMI and comparison groups using Kaplan-Meier survival curves and cumulative hazard and cumulative incidence distributions. Finally, the effect of involvement in DMI on time-to-failure is examined using the Cox regression model.

Sample Characteristics

This study compared a sample of 81 offenders who attended a DMI call-in meeting to a sample of 162 offenders arrested for selling drugs or possession with the intent to sell drugs around the time of a call-in meeting. Table 2 summarizes the general background characteristics of the two groups, including demographic characteristics (age at the beginning of the study period, sex, and race); and criminal history characteristics (number of arrests three years pre-intervention and most common type of offense three years pre-intervention). Due to propensity score matching the groups did not differ significantly with respect to the background characteristics.

Offenders in the DMI group were approximately the same age as those in the comparison group ($\bar{X}$ = 27.58 and 27.04, respectively). Most offenders were male, 88.9 percent for the DMI group and 89.5 percent for the comparison group, and most were Black, 97.5 percent for the DMI group and 93.8 percent for the comparison group. The demographic characteristics indicate that the sample consisted mostly of young Black males.

Table 2. Background Characteristics by Group

	DMI (n= 81)		Comparison(n= 162)		Sig.
	Mean	Std. Dev	Mean	Std. Dev	
Age	27.58	9.32	27.04	8.87	0.659
Prior Arrests	5.40	4.36	4.74	3.69	0.110
	n	%	n	%	
Sex					0.521
Male	72	88.9	145	89.5	
Female	9	11.1	17	10.5	
Race					0.346
Black	79	97.5	152	93.8	
White	2	2.5	10	6.2	
Common Arrest					0.152
Violent	11	14.1	15	9.7	
Property	14	17.9	43	27.9	
Drug	49	62.8	81	52.6	
Other	4	5.1	15	9.7	

Note: Common arrest is the most common type of offese offenders were arrested for prior to the start of the study.

Criminal history characteristics showed that on average the DMI group incurred more arrests than the comparison group ($\bar{X}$ = 5.40 and 4.74, respectively). Most offenders involved in DMI (62.8% or N=49) and a little more than half of those in the comparison group (52.6% or N=81) were most commonly arrested for drug offenses. This was followed by property crime arrests (DMI = 17.9%; comparison = 27.9%), violent crime arrests (DMI= 14.1%; comparison = 9.7%), and other arrests (DMI= 5.1%; comparison= 9.7%).

Re-arrest Characteristics

Table 3 presents data on whether and how often offenders in the study were re-arrested during the three-year observation period. While both groups' average number of arrests dropped during the observation period, the offenders in the DMI still averaged more arrests than the

Table 3. Re-arrest Characteristics by Group

	DMI (n= 81)		Comparison (n= 162)		Sig.
	Mean	Std. Dev	Mean	Std. Dev	
Post Arrests	4.27	4.59	3.35	3.28	0.074*
	n	%	n	%	
Prohibited Offense					0.079*
Yes	39	48.1	59	36.4	
No	42	51.9	103	63.6	
Drug Offense					0.785
Yes	42	51.9	81	50.0	
No	39	48.1	81	50.0	
Any Offense					0.226
Yes	64	79.0	138	85.2	
No	17	21.0	24	14.8	

*p<0.10

comparison group. The mean number of arrest for the DMI group was 4.27, while the mean number of arrest for the comparison group was 3.35, and this difference was statistically significant ($p<0.10$).

Results of the bivariate analysis of re-arrest for prohibited offenses, drug offenses, and any offense are also presented in Table 3. About 48 percent of offenders involved in DMI and 36 percent of offenders from the comparison group were re-arrested for a prohibited offense. The results show that involvement in DMI is associated with re-arrest for a prohibited offense. Contrary to the hypothesis, offenders involved in DMI were re-arrested more for a prohibited offense than those in the comparison group. About half the offenders in both groups (DMI= 51.9%; comparison= 50.0%) were re-arrested for a drug offense and most offenders in both groups (DMI= 79.0%; comparison= 85.2%) were re-arrested for any offense. No significant differences were found between the groups with respect to the proportion of offenders re-arrested for a drug offense or any offense.

To examine the effect of involvement in DMI on re-offending at the end of the three-year study period, logistic regression was used to predict re-arrest for a prohibited offense, drug offense, and any offense. Group membership (DMI vs. comparison) was used as the predictor variable, while controlling for sex, race, age, number of previous arrests, and most common type of offense. Table 4 presents the results of the logistic regression models for prohibited re-arrests, drug re-arrests, and any re-arrest. The logistic regression coefficient β, can be interpreted as the change in the log odds of the dependent variable (i.e., re-arrest) for a one-unit change in the predictor. Exp(β) represents the "odds" of re-arrest given a unit change in the predictor variable (controlling for other the other variables in the model). Values greater than one indicate increased odds and values less than one indicate decreased odds. The model for prohibited re-arrests indicates that the DMI group was more likely to be re-arrested for a prohibited offense. Although this difference is not significant, the results did not support the hypothesis. Age and prior number of offenses are statistically significant; the odds of re-arrest are higher for younger offenders and offenders with more arrests.

The results of the logistic regression for drug re-arrests and any re-arrest indicate that the DMI group was less likely to be re-arrested than the comparison group. While this difference was not significant for drug offenses,[13] it was significant for any offense ($p<0.10$). The odds of getting re-arrested for any offense were lower by a factor of 4.94 for offenders involved in the DMI. Age and number of previous offenses were significant in the drug re-arrest and any re-arrest model, consistent with the prohibited re-arrest model.

[13] The summary statistics for the drug re-arrest model did not indicate a significant "goodness of fit." The independent variables did not predict a significant amount of variance in re-arrest of drug offenses.

Table 4. Logistic Regression Models Estimating the Effect of DMI on Prohibited Re-arrest, Drug Re-arrest, and Any Re-arrest

	Prohibited				Drug				Any			
	β	S.E.	Sig.	Exp(β)	β	S.E.	Sig.	Exp(β)	β	S.E.	Sig.	Exp(β)
DMI	0.267	0.309	0.388	1.306	-0.052	0.292	0.859	0.950	-0.681	4.14	0.092*	0.506
control variables												
Sex	-0.180	0.558	0.747	0.836	0.203	0.500	0.685	1.225	-0.190	0.694	0.785	0.827
Race	-1.709	7.093	0.118	0.181	0.448	0.668	0.685	1.225	0.637	1.144	0.578	1.891
Age	-0.044	0.020	0.029**	0.957	-0.029	0.018	0.099*	0.971	-0.046	0.022	0.042**	0.956
Prior Arrests	0.090	0.041	0.030**	1.094	0.096	0.039	0.076*	1.071	0.276	0.086	0.001***	1.318
Common Arrest[a]			0.083*				0.646				0.446	
Violent	1.572	0.701	0.025**	4.818	0.278	0.627	0.658	1.32	-1.663	1.214	0.171	0.190
Property	0.204	0.625	0.744	1.227	-0.005	0.556	0.993	0.995	-1.841	1.142	0.107	0.159
Drug	0.580	0.591	0.327	1.786	0.41	0.522	0.432	1.507	-1.696	1.086	0.118	0.183
Constant	1.043	0.909	0.251	2.838	0.122	0.841	0.885	1.129	4.044	1.511	0.007	57.073
Model Chi-square	32.352**				10.482				29.654***			
Degrees of Freedom	8				8				8			
R^2	0.175				0.059				0.205			

[a]Other arrest is the reference category

*p<0.10, **p<0.05, ***p<0.001

Note: The pseudo R^2 is not the proportion of the variance in re-arrest explained by the model. In logistic regression it tends to underestimate the explanatory power, therefore it is a rough approximation of the effectiveness of the model.

Survival Analysis - Time-to-Failure

Step one in a continuous time survival analysis is describing the distribution of event occurrences through examination of the survival curve, cumulative hazard and cumulative incidence functions, and median lifetime (i.e., the distributions center). The median lifetime is the time at which the value of the estimated survivor function is 0.5; specifically, the point at which it is estimated that half the sample has experienced the event and half has not. This identifies the average survival time for the sample.[14]

Table 5 presents the survival probability and median lifetime by group for prohibited re-arrests, drug re-arrests, and any re-arrest. During the three-year period, thirty-nine offenders involved in DMI were re-arrested for a prohibited offense (48.1%), forty-two were re-arrested for a drug offense (51.9%), and 64 were re-arrested for any offense (79.0%). While fifty-nine offenders in the comparison group were re-arrested for a prohibited offense (36.4%), eighty-one were re-arrested for a drug offense (50.0%), and 138 were re-arrested for any offense (85.2%). The probability of survival for prohibited offenses did not drop below 0.5 for either group; as a result, the median lifetime could not be calculated. This indicates that for both groups the rate of re-arrest for a prohibited offense was low. For drug re-arrests, the probability of survival just drops below 0.5. The estimated median lifetime reveals that on average offenders involved in DMI were re-arrested for a drug offense 924 days after the start of the study period, while an

[14] Since events are censored, time is often skewed. Therefore, it is not appropriate to compute the mean, and the median lifetime is used.

Table 5. Median Lifetime, Survival Probability, and Log-rank and Breslow Tests of Re-arrest for the Three Year Observation Period

	Number of re-arrests n(%)	Median Lifetime (days)	Survival Probability	Log-rank Sig.	Breslow Sig.
Prohibited Re-arrest[a]				0.144	0.113
DMI (n= 81)	39 (48.1)	-	0.50		
Comparison (n=162)	59(36.4)	-	0.58		
Drug Re-arrest				0.922	0.694
DMI (n= 81)	42(51.9)	924	0.45		
Comparison (n=162)	81(50.0)	904	0.43		
Any Re-arrest				0.458	0.68
DMI (n= 81)	64(79.0)	164	0.20		
Comparison (n=162)	138(85.2)	186	0.11		

[a]Since survival probabilities barely reached 0.50 median lifetimes could not be calculated.

offender in the comparison group was re-arrested 904 days after the start of the study period (about 24 days later than the DMI group). Finally, for any re-arrest, the probability of survival drops well below .50 for each group, which indicates a high rate of recidivism for both groups, with offenders in the comparison group having the lowest survival rate. Although offenders in the comparison group had a lower probability of survival, the estimated median lifetimes reveal that on average, an offender in the comparison group was re-arrested for any offense about 22 days later than offenders in the DMI group (186 days vs. 164 days).

Survival Curves

Survival and hazard functions are often best presented graphically because the key point is determining the general shape of the patterns rather than the precise numeric values. Figure 2 displays Kaplan-Meier survival curves stratified by group for prohibited re-arrests. At the beginning of time, when no one has been re-arrested everyone is surviving, so by definition the value is one. Over time as events occur, the survivor function declines toward zero. The graph shows that the comparison group had a consistently higher survival distribution that the DMI

group. This signifies that the comparison group committed prohibited offenses at a slower rate than the DMI group. The log-rank test and Breslow test (Table 5) indicate that the differences between the survival curves are not significant. Involvement in DMI did not change the survival distribution for offenders during the three-year follow-up.

Figure 2. Kaplan-Meier Survival Curves Stratified by Group, Prohibited Re-arrest

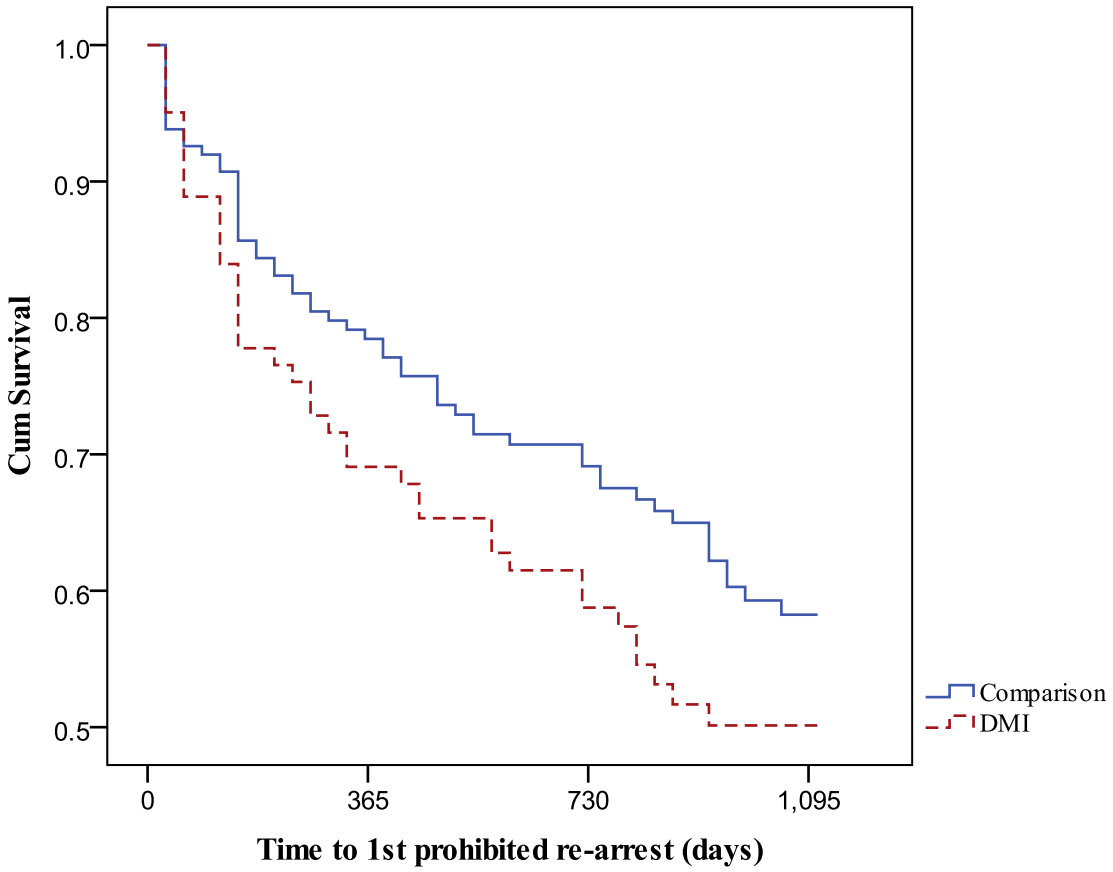
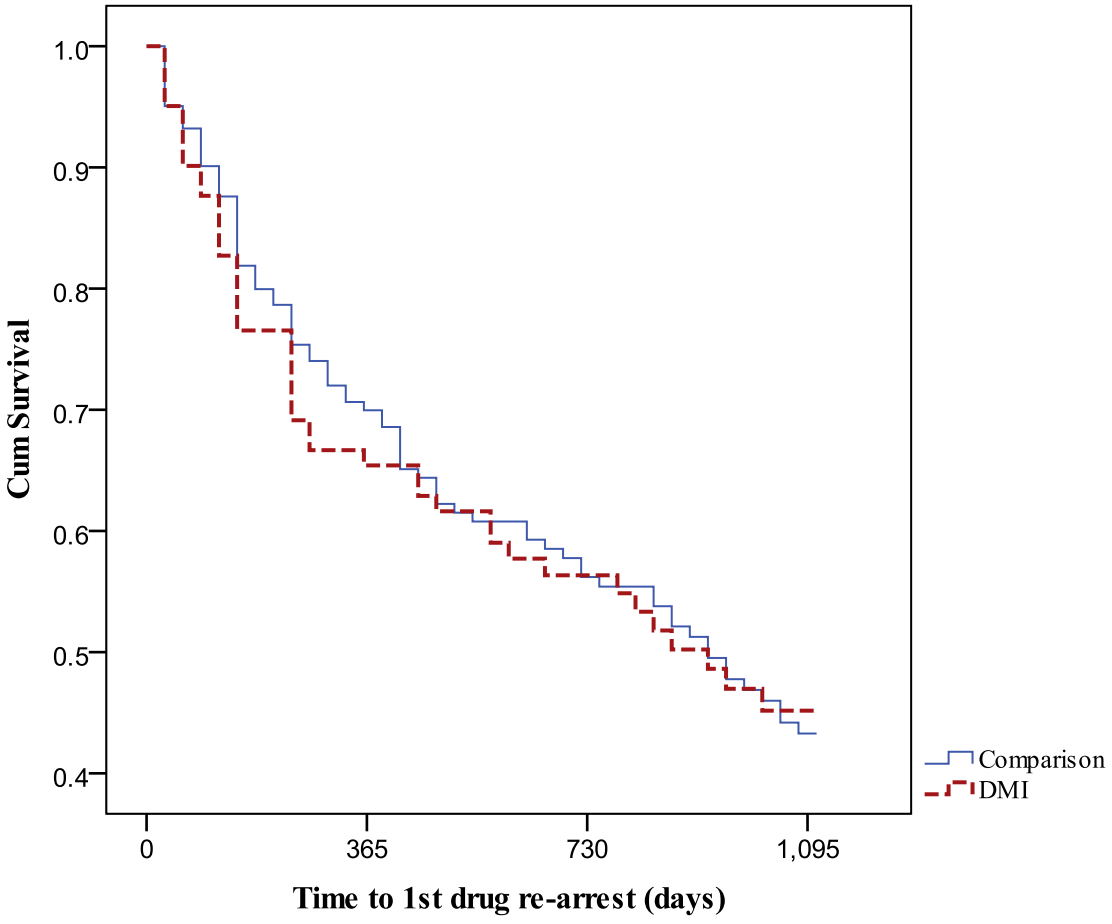


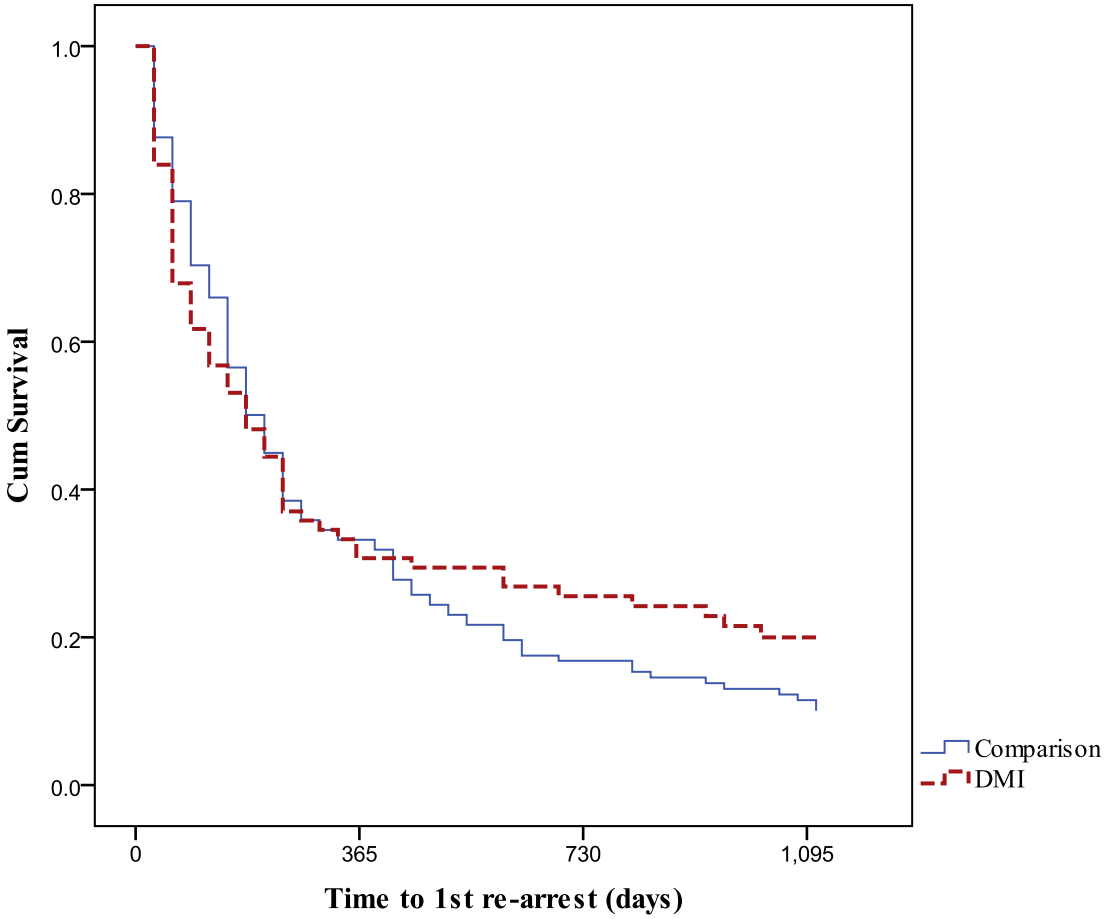
Figure 3 and Figure 4 display survival curves for drug re-arrests and any re-arrest, respectively. The graph for drug re-arrests (Figure 3) shows that the two groups were re-arrested at the same rate. For about the first year, offenders involved in the DMI had a lower probability of survival; however, by the end of the three-year period there was no difference between the two groups.

Figure 3. Kaplan-Meier Survival Curves Stratified by Group, Drug Re-arrest



The graph for any re-arrest (Figure 4) shows that early in the study period the probability of survival was lower for offenders in the DMI group, then just more than one year into the study period their probability of survival became better than that of the comparison group and consistently stayed higher. For both drug re-arrests and any re-arrest, there were no significant differences between the survival curves for the groups (Table 5). Over the three-year period offenders in the DMI group and offenders in the comparison group committed drug offenses and any offense at about the same rate.

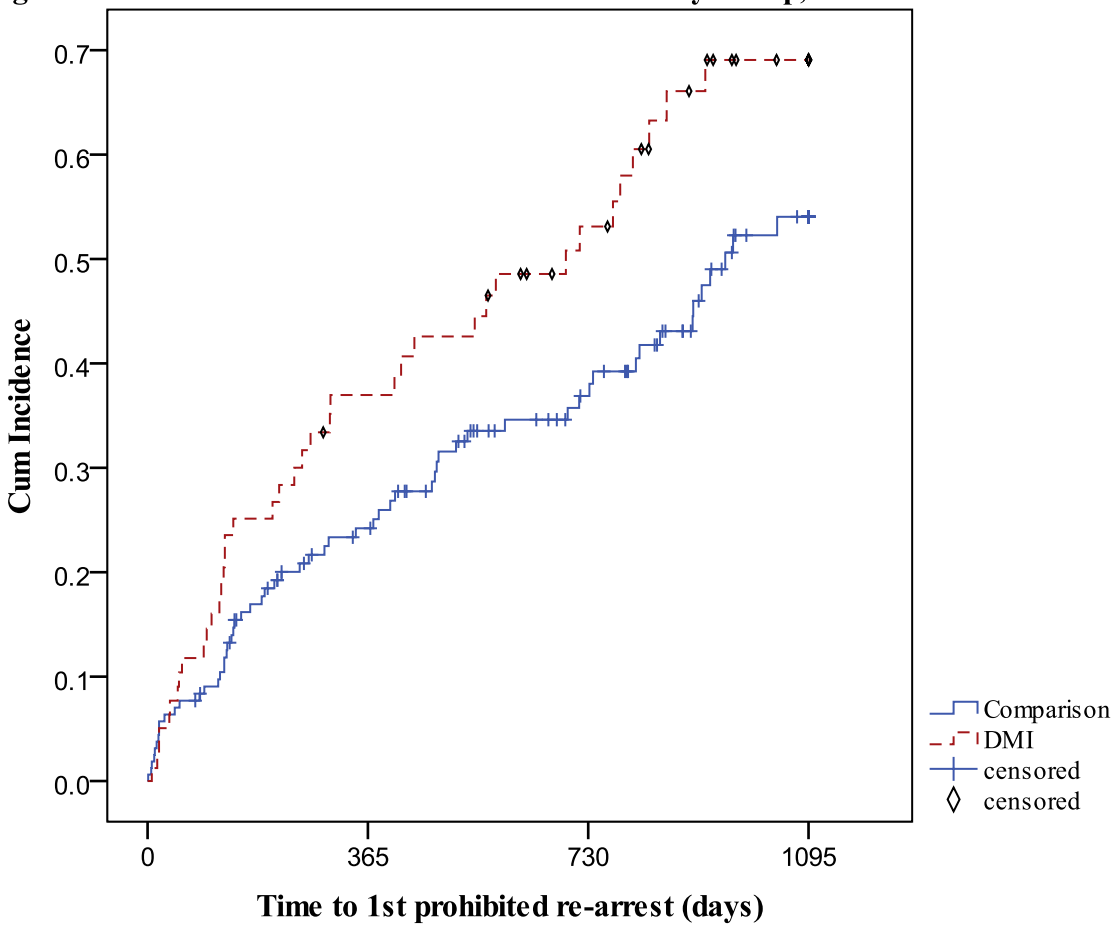
Figure 4. Kaplan-Meier Survival Curves Stratified by Group, Any Re-arrest



Cumulative Hazard and Cumulative Incidence Functions

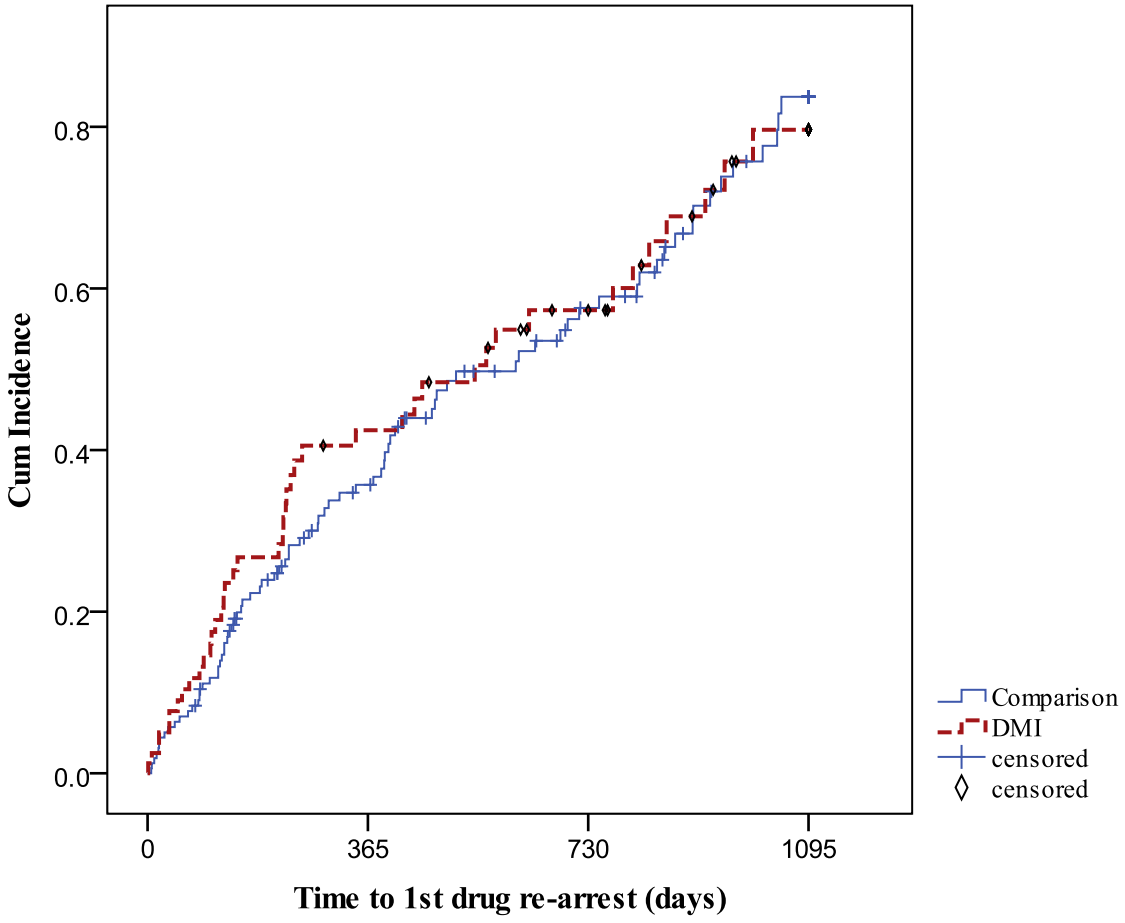
When examining cumulative hazard function and cumulative incidence functions it is important to assess how the level of the underlying hazard functions differ between the groups. An examination of the level (e.g., the vertical distance between the functions) of the cumulative hazard determines how different the underlying hazard functions are. Figure 5 and Figure 6 display the cumulative incidence functions for prohibited re-arrests and drug re-arrest stratified by group, while Figure 7 display the cumulative hazard functions for any re-arrest.

Figure 5. Cumulative Incidence Functions Stratified by Group, Prohibited Re-arrest



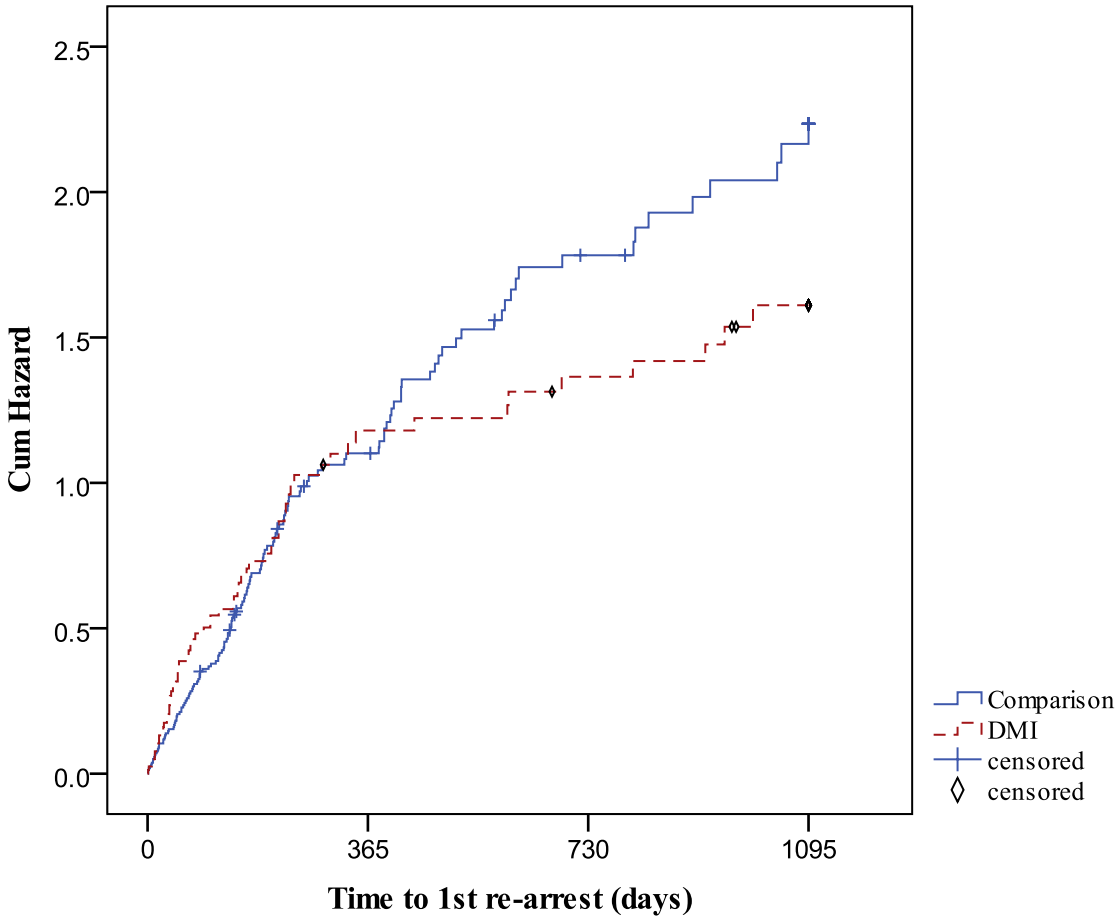
For prohibited re-arrests (Figure 5), the cumulative incidence for those in the DMI group was consistently higher and the distance between the functions widened as time went on. This suggests that involvement in DMI was related to a higher risk of re-arrest for prohibited offenses. The cumulative incidence functions for drug re-arrests (Figure 6) are similar and do not diverge; suggesting that the risk of re-arrest for drug offenses was the same for both groups. Finally, for any re-arrest (Figure 7), the cumulative hazard function for the DMI group starts higher, and a

Figure 6. Cumulative Incidence Functions Stratified by Group, Drug Re-arrest



little after one year the hazard function for the comparison group rises above the DMI group and the distance between the functions widens. This suggests that the risk of re-arrest was higher for the DMI group early on; however, those who survived the high risk time had a lower risk of re-arrest than offenders in the comparison group.

Figure 7. Cumulative Hazard Functions Stratified by Group, Any Re-arrest



Cox Regression

Cox regression analysis is used to examine the effect of involvement in DMI on time to re-arrest. Cox regression measures the relative hazard risk for re-arrest not the absolute hazard risk; therefore comparative statements about the hazard can be made, but not absolute statements (Singer & Willett, 2003). Table 6 presents the results of the Cox regression for prohibited-re-arrests, drug re-arrests, and any re-arrest. Model 1 displays the effects of DMI on time to re-arrest controlling for time-invariant covariates. The hazard ratio is the predicted change in the hazard of re-arrest for a one-unit change in the predictor (controlling for other variables in the model). Values greater than one indicate increased hazard risk and values less than one indicate decreased hazard risk. Model 1 shows that the risk of re-arrest for a prohibited offense was greater for offenders in DMI than offenders in the comparison group; however, this difference was not significant. Similar to the results of the logistic regression, these results did not support the hypothesis. Offenders involved in DMI had a shorter time to re-arrest than offenders in the comparison group. The results of Model 1 for drug re-arrest shows that the risk of re-arrest for offenders in the DMI group did not differ significantly from those in the comparison group. Although not significant, this outcome is moving in the hypothesized direction; the risk of re-arrest for a drug offense was greater for the comparison group than for the DMI group.

A look at the cumulative hazard functions for any re-arrest (Figure 7) shows that the functions cross during the observation period. This is a sign that the hazards are not proportional. The effect of involvement in DMI may differ at different time periods; however, the difference is not systematically related to time. A segmented time-dependent covariate was constructed by taking the product of time and involvement in DMI (T_DMI). A test of this covariate indicates

that the effect of DMI on re-arrest was time dependent; therefore the term was added to the model for any offense to control for this dependence. The results of Model 1 show that involvement in DMI did not have an effect on re-arrest for any offense. There was no significant difference between the groups on the risk of re-arrest for any offense.

To control for the fluctuating nature of crime rates which may affect risk differently during different periods of time, violent, property, and drug crime rates were added to the model as time-varying covariates (Model 2). The results indicate that the violent and property crime rates affected the risk of re-arrest for prohibited offenses and drug offense, while only the property crime rates had an effect on any offense. Although the addition of these crime rates improved the model, they did not change the effect of DMI on re-arrest; it remained non significant.

Table 6. Cox Regression Models Estimating the Effect of DMI on Prohibited Re-arrest, Drug Re-arrest, and Any Re-arrest Hazard Rates

	Prohibited				Drug				Any			
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
	Hazard Ratio	Sig.	Hazard Ratio	Sig.	Hazard Ratio	Sig.	Hazard Ratio	Sig.	Hazard Ratio	Sig.	Hazard Ratio	Sig.
DMI	1.096	0.673	1.198	0.414	0.874	0.499	0.852	0.442	1.177	0.438	1.154	0.499
control variables												
Sex	1.182	0.687	1.158	0.728	1.366	0.390	1.089	0.815	1.388	0.240	1.270	0.402
Race	0.218	0.136	0.220	0.138	1.339	0.502	1.352	0.490	1.114	0.752	1.033	0.924
Age	0.967	0.038**	0.969	0.051*	0.980	0.139	0.981	0.150	0.973	0.007**	0.970	0.004**
Prior Arrests	1.060	0.010**	1.059	0.011**	1.063	0.005**	1.070	0.002**	1.109	0.000***	1.111	0.000***
Common Arrest[a]		0.012**		0.014**		0.266		0.148		0.803		0.449
Violent	3.794	0.010**	3.612	0.013**	1.593	0.306	1.621	0.293	0.871	0.681	0.739	0.376
Property	1.510	0.420	1.427	0.490	1.130	0.767	1.349	0.475	1.098	0.743	1.026	0.969
Drug	1.993	0.158	2.002	0.156	1.694	0.173	2.065	0.066*	1.101	0.722	1.137	0.637
T_DMI	-	-			-	-	-	-	0.998	0.023***	0.998	0.032**
Violent crime rate	-	-	1.000	0.014**	-	-	0.999	0.000***	-	-	1.000	0.149
Property crime rate	-	-	1.000	0.002**	-	-	1.000	0.000***	-	-	1.000	0.000***
Drug crime rate	-	-	1.000	0.311	-	-	1.000	0.998	-	-	1.000	0.543
Model Chi-square	38.368***		63.024***		18.136**		71.497***		63.902***		90.382***	
Degrees of Freedom	8		11		8		11		9		12	
-2 Log Likelihood	951.959		929.235		1185.083		1141.668		1795.41		1772.833	

Note: The -2 Log Likelihood is the measure of model fit. The reduction of the -2 Log Likelihood between models signifies that the model was improved by adding the crime rates.

[a]Other arrest is the reference category

*p<0.10, **p<0.05, ***p<0.001

CHAPTER 6: DISCUSSION AND CONCLUSION

Research examining the effects of focused deterrence strategies have typically concentrated on the community-level effects of the strategies, most notably, change in homicide rates (Braga et al., 2001, 2008; Braga, McDevitt & Pierce, 2006; Corsaro & McGarrell, 2009, 2010; Engel et al., 2001; Kennedy & Braga, 1998; McGarrell et al., 2006; Papachristos, Meares, & Fagen, 2007), gun assaults (Braga et al., 2001; Braga, McDevitt & Pierce, 2006; Skogan et al., 2009), shots fired calls (Braga et al., 2001; Kennedy & Wong, 2009), and crimes associated with drug markets (Corsaro & Brunson, 2013; Corsaro, Brunson, & McGarrell, 2010; Frabutt et al., 2009; Hipple, Corsaro, & McGarrell, 2010; Kennedy & Wong, 2009). With the exception of Chermak (2008) and Papachristos et al (2013), individual-level effects of the offenders targeted for these interventions have not been examined. In High Point specifically, studies on the DMI have found it to have a positive crime-control effect at the community level (Frabutt et al., 2009; Hipple, Corsaro, & McGarrell, 2010; Kennedy & Wong, 2009), but little is known about the outcomes of the individuals targeted for the intervention. Using survival analysis to compare the recidivism patterns of offenders who attended a DMI call-in meeting relative to those of an equivalent comparison group, this study examines the DMI's specific deterrent effect on the offenders targeted to participate in the intervention. This final chapter begins with a summary and discussion of the findings, followed by a discussion of the limitations, theoretical implications and suggestions for future research, and concludes with implications for policy.

Summary and Discussion

The hypotheses explored in this study were:

1) Offenders who attend a DMI call-in meeting will have a lower incidence of re-offending than those of an equivalent comparison group.
2) Offenders who attend a DMI call-in meeting will have a longer time to re-arrest (time-to-failure) than an equivalent comparison group.

With certain components of the intervention aimed at influencing offender behavior (i.e., the call-in where the deterrent message is delivered, family involvement, social services, law enforcement follow-up, and enforcing consequences) theory would suggest that the extra attention given to those in the DMI group would result in a lower level of re-offense and a longer time to re-offense than those who received the traditional criminal justice treatment (comparison group). The hypotheses were tested for prohibited offenses (those offenses that the DMI officials told offenders would incur increased sanctions), any drug offense, and any offense.

Prohibited Offenses

The analyses of prohibited offenses revealed no support for the hypotheses. The results of the bivariate analysis showed that the incidence of re-arrest was not lower for the DMI group; in fact, offenders involved in DMI had a significantly higher number of re-arrests for a prohibited offense than offenders in the comparison group. Findings from the logistic regression revealed that participation in DMI was not a significant predictor of re-arrest for a prohibited offense. Though not significant, the effect of participation in DMI on re-arrest was not moving in the expected direction; the odds of re-arrest were *more* likely for offenders involved in DMI than

those in the comparison group. Similar results were obtained from the survival analysis. The survival probability for both groups never dropped below 0.5 indicating that both groups had a low rate of re-arrest for prohibited offenses. However, the survival curves and cumulative incidence functions for prohibited offenses indicated that offenders in DMI were consistently at *greater* risk of re-arrest and had a shorter time to re-arrest than the comparison group.

While these results are not consistent with the hypotheses, they may indicate success for one of the components of the intervention: law enforcement follow-up. Offenders in the DMI are supposed to be watched closely by DMI officials and evidence from the re-entry literature has found that enhanced surveillance can increase officials' ability to detect criminal behavior (Petersilia & Turner, 1993). If DMI officials are keeping a closer watch on offenders in the intervention, it follows that they would experience a greater risk of re-arrest than offenders in the comparison group. Additionally, one of the main goals of the DMI is improving the communities where it is implemented by reducing the crime rate. As a result, if offenders are continuing to commit prohibited offenses after attending the call-in, getting them "off the streets" is what matters. Because these offenders were thought to be the ones driving the drug problem in the communities, the quick removal of the offenders who continued to commit prohibited criminal behavior may have contributed to the success of the DMI at the community-level.

The results for prohibited offenses were also inconsistent with the study conducted by Papachristos et al. (2013) for PSN Chicago, which used a focused deterrence strategy to reduce the city's homicide and gun violence rates. They found that offenders who participated in the PSN offender notification forums, on average, stayed out of prison longer and had a lower hazard of committing a new offense than offenders in the comparison group (e.g. those that did

not participate in an offender notification forum). The difference between these findings may be because the PSN Chicago strategy did not call for enhanced surveillance of attendees after the forum.

Drug Offenses

Results from the analyses of drug offenses showed no support for the hypotheses. The bivariate analysis revealed no differences in the incidence of re-arrest; the proportion of offenders re-arrested for a drug offense did not differ significantly between the groups. Results from the logistic regression suggest that participation in DMI was not a significant predictor of re-arrest for a drug offense. At the end of the three-year study period, involvement in DMI was not found to have an effect on the incidence or odds of re-arrest for a drug offense. The survival curves and cumulative incidence functions for drug re-arrests revealed no difference between the groups. The Cox regression models also found that DMI had no effect on the hazard rate for drug offenses. Time to re-arrest was not significantly influenced by involvement in DMI.

Any Offense

Results from the analyses of any offense showed little support for the hypotheses. The bivariate analysis revealed no differences in the incidence of re-arrest for any offense; however, the results of the logistic regression suggest that participation in DMI was a significant predictor for any offense. The odds of being re-arrested for any offense were lower for offenders in the DMI. The survival curves and cumulative hazard functions for any re-arrest revealed no differences between the groups. Findings from the Cox regression model suggest that time to re-arrest for any offense was not significantly influenced by involvement in DMI.

The findings for drug offense and any offense categories are consistent with Chermak's (2008) study of the Indianapolis Lever-Pulling experiment, which found that there was no difference between the two treatment groups[15] and control group on likelihood of recidivism and time to arrest post-intervention meeting for all offenses and felony offenses. The DMI's lack of effect on re-arrest for drug offenses and any offense may stem from the components of the intervention meant to influence offender behavior not working or being implemented as intended. For example, Chermak (2008) found that probationers in the law enforcement and community treatment groups were no more likely to take advantage of community programming (education programs, treatment programs, work programs, and faith-based programs) than the control group. This indicates that having services available does not guarantee that offenders will take advantage of them. If offenders are not taking advantage of the services being offered, then the services cannot have the intended influence on offender behavior.

Limitations

This study has several limitations. First, when conducting propensity score matching, omitting important variables could increase the bias in the resulting estimates (Caliendo & Kopeinig, 2005; Heckman, Ichimura, & Todd, 1997). Matching for this study was done using variables constructed from the available data. Important potential confounders may have been

[15] The study had two treatment groups. The law enforcement group attended a call-in at a courthouse with several law enforcement officials in attendance. Probationers were given the message that violence would not be tolerated and they would incur a number of sanctions if it continued. They were also told services were available to them if they wanted to take advantage of them. The community group attended a call-in at a community center. It was less formal with the only law enforcement presence being a probation officer to check probationers in to the meeting. The deterrence message was delivered by community members who spoke about the problems violence has caused in the community. Probationers were told services were available and they should contact community leaders; however, no possible sanctions were discussed during the meeting.

omitted due to data limitations. Bootstrapping would have been one way to handle this issue; however, this procedure could not be preformed due to limitations of the analysis program.

Second, the small sample size of the treatment (DMI) and comparison group limits the ability to perform additional analyses that could detect conditional relationships between the intervention and other variables. Analyzing separate models allows researchers to determine if the combined effects of the control variables behave differently across models (Paternoster et al., 1998). It would be beneficial to run separate models for the treatment (DMI) and comparison group to examine the effects of the control variables on the populations separately. If, for example, age and previous arrests lose significance in the treatment model but not in the comparison model; the intervention could be said to have a conditional effect on the risk of re-arrest. The small sample size of offenders in each call-in period also limited the ability to examine effects of the intervention across intervention sites; effects of the intervention had to be aggregated across call-in periods. Small sample sizes are closely related to measures of statistical power and given the small number of offenders in each call-in (Lipsey, 1999).

Third, this study theorizes that certain components of the intervention such as social services, family involvement, and enforcing consequences would influence offender behavior; however, these components could not be tested directly. Without testing these components directly their effects can only be speculated. This study was also unable to determine if these components were implemented as intended (for example of services not being implemented as intended see Engel et al. 2011). If components are not fully realized, then effects of the components can not truly be tested, this is discussed further in the following section.

Future Research and Theoretical Implications

Although prior research suggests that the DMI intervention is having a positive effect on neighborhood levels of crime and quality of life, the results from this study suggest that the call-in meetings are not having the anticipated specific deterrent effect on the drug offenders that participate in the call-in meetings. As noted above, components of the intervention that are thought to influence offender behavior such as social services, family involvement, enforcement consequences, the call-in process and deterrence message could not directly be tested. Future research should focus on how these components directly affect offender behavior.

Social services. Studies have found that offenders in these interventions rarely take advantage of the social service programs For example, Engel et al (2011) found that the social service program for the Cincinnati Initiative to Reduce Violence (CIRV) was not being carried out as expected. They suggest that the social service program showed no impact on the reduction of violence in the city because it was not implemented as expected (also see Chermak, 2006; Tillyer et al., 2010). If offenders are not taking advantage of the services, then the effect of the services can not actually be measured. Future studies should examine if, and to what extent, services were being utilized by offenders in the DMI to determine if the purpose behind having social services was achieved as planned.

Family involvement. Family members and loved ones of the offenders (i.e., influentials) were invited to the call-ins under the premise that individuals significant to the offenders would be able to convince them to stop offending by creating and reinforcing positive norms and expectations (Kennedy & Wong, 2009). Researchers suggest that significant people in an individual's social environment can be used as a form of informal social control (Grasmick &

Bursik, 1990; Williams & Hawkins, 1986). Additionally, evidence from perceptual deterrence theory points to the importance of social censure from important others as a significant factor in inhibiting crime, often more important than fear of legal sanctions (Paternoster & Bachman, 2013). However, it is not known whether these influentials continued to support the offenders after the call-in, or if they were positive influences to begin with. For example, a DMI official interviewed in Rivers, Norris, and McGarrell (2012) explained that some offenders sold drugs because their mothers made them (pg. 72). The involvement of these types of family members would defeat the purpose of family involvement. Future research on this component should focus on the level and type of support that influentials provide to the offenders.

Follow-up. When looking at the combined results of the prohibited offense, drug offense, and any offense analyses there are indications that the intervention may be having an effect on police discretion. Whereas increased surveillance helps explain why DMI clients are arrested faster and more often than offenders in the comparison group for prohibited offenses, it does not explain why there were no differences between the groups for the drug and any offense categories. If DMI clients are being surveilled more often, then it stands to reason that they should have been arrested faster and more often for drug and any offenses as well. However, these results can be explained if there were factors limiting officer discretion, especially for prohibited offenses. To enforce the deterrence message officers were supposed to arrest DMI clients for committing prohibited offenses. That is, as part of the DMI intervention officers may have felt they had no choice. For non-prohibited offenses, however, officers may have been able to exercise more discretion on how they handled the situations. This may reflect a situation whereby for DMI clients the prohibited offenses reflected "non-normal" crimes that thereby limited officer discretion and resulted in arrests (Sudnow, 1965). Therefore, even if officers did come in contact

with DMI clients committing minor offenses they may have let it go because it did not rise to the level of a prohibited offense.[16]

Future research should examine whether the offenses offenders in each group were arrested for can be subject to discretion. For example, prohibited offenses could be broken down by level of seriousness to examine whether DMI clients are more likely to be arrested for less serious prohibited offenses, thereby suggesting restricted officer discretion for prohibited offenses. The number of police contacts could also be examined to determine if DMI clients had more contact with officers as predicted by their increased surveillance. This may indicate that officers have more opportunities to exert discretion but were restricted from doing so because of DMI program rules.

Enforcing consequences. One of the consequences laid out by program officials were harsher punishments for offenders who committed prohibited offenses. The increased certainty and severity of sanctions put forth in the deterrence message was intended to act as a deterrent. While program officials seemed to deliver on the increased certainty of arrest, they may not have followed through on the increased severity. For example, Chermak (2008) found that probationers' in the treatment groups did not incur harsher penalties or have more levers pulled than the control group. Therefore, if, as theory suggests, individuals change their criminal behavior in response to the consequences that are incurred (or not incurred) by their behavior, officials not delivering on the harsher sanctions may keep offenders from altering their behavior in the intended way (Nagin, 1998; Piquero & Pogarsky, 2002; Pogarsky et al., 2004). Future

[16] While conducting interviews of DMI experts to construct a mental model of the DMI for River, Norris, and McGarrell (2012), some DMI officials mentioned that if they saw offenders in the program committing minor offenses they would often just give them a warning. This was to let them know they were serious about trying to help them and giving them a second chance.

research on this component should compare the length of sentences incurred by offenders in the treatment and comparison group for prohibited offenses to determine if DMI clients actually receiver harsher sanctions. Then, to fully examine this component, a recurrent event survival analysis should be conducted to examine the effect of sentence length on subsequent re-arrests. Program officials look to make examples out of offenders that do not comply; however, if they do not deliver on the stated consequences then the intervention loses credibility.

Call-in and Deterrence message. Both deterrence theory (Nagin, 1998; Paternoster, 2010) and procedural justice (Tyler, 2003, 2006) use offender perceptions to try to influence behavior; deterrence theory through changes in the perception of certainty, severity, and swiftness of sanctions and procedural justice through perceptions of the fairness of the process and legitimacy of the authority. The DMI could be seen as utilizing the concepts of both theories simultaneously to change the behavior of offenders in the program. During the call-in a deterrence message is directly communicated to the offenders that looks to increase their perceived certainty of getting arrested, the perceived swiftness with which it will happen, and the perceived severity of their subsequent punishment. Although DMI officials are delivering a deterrence message that could seem like a threat, they are supposed to communicate it in a respectful manner, eliciting feelings of fairness from the offenders. Even though offenders in the DMI are told they would be watched more closely and would incur harsh sanctions, they were also being given a second chance (not being arrested for a case that was already made) and were being offered support by program officials and members of the community. It was theorized that offenders would change their behavior if they perceived an increase in the certainty, severity, and swiftness of the sanctions laid out by the deterrence message delivered during the call-in and if they found the policies and procedures of the intervention to be fair and just. This study,

however, was not able to test how offenders perceived the process, or the message that was delivered to them.

If there are inconsistencies in the clarity of the deterrence message or in how the message is delivered then it could change how the offenders perceive the message and their subsequent behavior. For example, DMI officials could gain cooperation if offenders "buy-in" to the intervention, but according to Tyler (2003) this usually cannot be done by using threats. If the deterrence message is viewed as a threat, offenders may be less likely to buy-in to the intervention and comply with program officials or take advantage of the services they offer. If offenders feel like they are being threatened they may no longer feel like the process is fair or the authority figures are being just. The context in which the message is delivered may also be important. Offenders may view the process as threatening and unfair because the message is delivered at police headquarters in front of the community. If offenders feel disrespected or embarrassed by the process, they may be less likely to view the process as legitimate and therefore, less likely to comply with intervention rules and policies.[17]

[17] While Papachristos et al (2013) suggests that offender success in their study was due to the strengthened perceptions of legitimacy and fairness gained from the PSN Chicago offender notification forums; they did not actually test whether offenders perceived the process to be more legitimate. The PSN Chicago offender notification forums were also conducted in a different setting and under a different context than DMI call-ins. For example, Chicago forums were held in neutral locations like public buildings or community centers while DMI call-ins were held at High Point police headquarters, a more formal and possibly intimidating location. This could have an effect on how offenders view the legitimacy and fairness of the process. Future research is needed to better understand how factors like meeting setting, number and nature of speakers, order of speakers (e.g., criminal justice official versus community members and social service representatives) influence the perception of the meeting attendees.

Deterrence researchers have discussed the importance of measuring perceived deterrence; especially how perceptions of sanction threats are formed and modified over time (Paternoster & Bachman, 2013; Piquero & Pogarsky, 2002; Pogarsky et al., 2004). Perceptual deterrence theory assumes that motivation to commit crime is affected by perceived consequences of criminal behavior, positive or negative (Paternoster & Bachman, 2013). That is, offenders' decisions will be more influenced by what they think or perceive the sanctions to be, regardless of what they actually are. Therefore, it is important to understand how offenders who attended call-in meetings perceived the deterrence message and the consequences that were presented.

Communication Theory and Call-in Meetings. One way to examine how offenders process and perceive the deterrence message is through the examination of fear appeals, specifically utilizing the Extended Parallel Process Model (EPPM). The EPPM is a fear appeal theory which accounts for responses to fear appeal messages that lead to both success (message acceptance) and failure (message rejection) (Witte, 1992; Witte, Meyer, & Martell, 2001). The EPPM suggests that two distinct processes occur when responding to fear appeals: a danger control process and a fear control process (Witte, 1992; Witte, Meyer, & Martell, 2001). The danger control process is the cognitive process that occurs when individuals are dealing with a danger or threat. It leads to protection motivation, causing the individual to change their attitudes, intentions, or behaviors to protect against the threat occurring (Witte, 1992; Witte, Meyer, & Martell, 2001). The fear control process is the emotional process that occurs when individuals are faced with a significant threat. This leads to defensive motivation, causing individuals to cope with the fear through denial (e.g., a refusal to believe that they could experience the threat), defensive avoidance (e.g., distorting or blocking further information about the threat) or reactance (e.g., rejection or anger at the message due to perceived manipulation) (Witte, Meyer, & Martell, 2001).

In the EPPM these two response processes are elicited through the interaction of three constructs: fear, perceived threat, and perceived efficacy (Witte, 1992). Fear is a negatively valenced emotion elicited through a threat which the individual perceives to be significant and personally relevant (Witte, 1992). Perceived threat is the idea that a threat exists only because the individual thinks it does and this perception can be real or imagined (Witte, 1992; Witte, Meyer, & Martell, 2001). In the model, perceived threat is characterized by perceived susceptibility and perceived severity. Perceived susceptibility refers to an individual's beliefs about their chances of experiencing the threat (Witte, 1992; Witte, Meyer, & Martell, 2001). Perceived severity refers to an individual's beliefs about how serious the threat is or how much harm would occur if the threat were to take place (Witte, 1992; Witte, Meyer, & Martell, 2001). Efficacy refers to the effectiveness of the recommended response (response efficacy) and the individual's ability to perform that recommended response (self-efficacy). Perceived response efficacy is an individual's "beliefs about the effectiveness of the recommended response in deterring the threat" (Witte, Meyer, & Martell, 2001, p.20). Perceived self-efficacy refers to an individual's beliefs about his or her own ability to perform the recommended response to prevent the threat (Witte, 1992; Witte, Meyer, & Martell, 2001).

The DMI's deterrence message can be thought of as a fear appeal because the offenders are warned that if they continue their criminal behavior it will result in the harshest possible legal sanctions (Kennedy, 2009). They are presented with a message designed to scare them into stopping their behavior and threatened with what will happen if they do not comply. The threat perceived by the offenders includes the perceived susceptibility (e.g., whether the offenders thinks they will go to jail if they continue their behavior) and the perceived severity (e.g., how serious the offenders believe the harsh jail sentence to be). Efficacy involves whether the

offenders believe that stopping the behavior will keep them out of jail (i.e., perceived response efficacy) and whether they believe they will be able to stop offending (i.e., perceived self-efficacy). The DMI tries to increase the offenders' perception of self-efficacy by linking them with programs and social services such as employment training, housing, mentoring, and substance abuse treatment to provide them with options to help improve their situation.

When the offenders are presented with the deterrence message first the perceived threat found in the message is appraised. If they perceive the threat to be low – there is no way they will get arrested again and go to jail (e.g., perceived susceptibility) – and/or they do not think going to jail is a big deal (e.g., perceived severity) then there is no response to the message; the offenders stop processing the message. If they perceive the threat to be high – they believe they will go to jail if they continue to sell drugs and/or they believe the stiff jail sentence to be serious – and perceive efficacy to be high – the offenders believe that stopping their behavior will keep them out of jail (e.g., perceived response efficacy) and they believe they will be able to stop their behavior (e.g., perceived self-efficacy) – then danger control processes are initiated and the offenders will try to control the danger of the threat by following the recommended response and stopping their offending behavior. However, if the offenders perceive the threat to be high and they do not believe that stopping their behavior will keep them out of jail – "the police will just find something else to arrest me for because they are watching" (e.g., low perceived response efficacy) – or they do not believe that they can stop offending – "there is no other way I can make the kind of money I make from selling drugs" (e.g., low perceived self-efficacy) – then fear control processes are elicited. As a result offenders might respond to the message through a maladaptive response such as defensive avoidance (e.g., the thought of going to jail may be too scary so they stop listening to the message), denial (e.g., "I won't go to jail because I won't get

caught again"), or reactance (e.g., "The police are just trying to manipulate me so I'm not going to listen to them") leading to message rejection and continued offending.

Procedural justice and perceptual deterrence theory stress the importance of understanding how an individual's perceptions influence behavior; whether it is the perception of the legitimacy and fairness of the process or the perceptions of the certainly, severity, and swiftness of the consequences. If future research can tease out how offenders are processing the deterrence message and how it is delivered through the use of the EPPM, we may be able to understand why the message is not having the expected effect on offender behavior. A better understanding of how offenders who attend the call-in meetings perceive the process and the deterrence message that is delivered to them during the meeting will also help inform better implementation of DMI processes aimed at targeted offenders and delivery of the deterrence message.

Policy implications

Overall, this study found that the DMI did not have a specific deterrent effect on the targeted offenders. Although not the expected outcome, in the end, the DMI is designed to be a community-based intervention, with the goal of eliminating drug markets and crime problems associated with those markets and improving public safety in the neighborhoods. The DMI appears to be effective at the community-level (Corsaro & Brunson, 2013; Corsaro, Brunson, & McGarrell, 2010; Frabutt et al., 2009; Hipple, Corsaro, & McGarrell, 2010; Kennedy & Wong, 2009). And, although components of the intervention aimed at influencing offender behavior did not have the intended effect on re-offending overall, that is, offenders in the DMI group were arrested faster for prohibited offenses and outcomes of the offenders in the DMI group were no

better for drug offenses and any offense than those in the comparison group, findings from this study suggest that certain components of the intervention aimed at individual-level effects (e.g., law enforcement follow-up and the call-in) may help contribute indirectly to the overall goal of the intervention. Based on these findings and knowledge of the program, two implications for policy are presented.

First, social services such as substance abuse treatment, housing assistance, and education and employment assistance are thought to be important factors which will assist offenders in reintegrating successfully in the community; however, participation in social services is voluntary for offenders in the DMI. As stated earlier, other studies utilizing a focused deterrence strategy have found that offenders targeted for the interventions rarely take advantage of the services offered (Chermak, 2008; Engel et al., 2011; Tillyer et al., 2010). For example, in the Cincinnati CIRV social service program, less than nine percent of the social service clients actively participated in services (Engel et al., 2011). Program officials need to find a way to increase participation in services while providing offenders with a caseworker or mentor to make sure they stay on task and utilize the services they need. This could impact the effect of this intervention component on offender outcomes. Rivers, Norris, and McGarrell (2012) suggested that these services need to be resilient and redundant, and to accomplish this there needs to be a wide range of overlapping services provided by multiple providers. Along with resilient and redundant services, they suggest that the effectiveness of this component also lies in the provider's ability to follow through with the services. An example of this is illustrated by the Boston Reentry Initiative (BRI). The BRI used a strategy similar to focused deterrence on violent offenders being released from jail. Participants were identified while still incarcerated, once identified they attended a BRI panel session where they were given the impression that

multiple law enforcement agencies would be watching them when they were released while also being informed of community resources and institutional programs available to them. They were assigned mentors and enrolled in a number of wrap-around services. An evaluation of the program found that the BRI was associated with a 30 percent reduction in arrest rates for violent and all offenses, comparing participants in the program to an equivalent control group (Braga et al., 2009). Having treatment plans that offenders must follow can have a positive effect on their reintegration in to the community and may result in the social services component having the interned effect on the offenders.

Second, as noted above, findings from this study suggest that certain components of the intervention aimed at individual-level effects may help contribute indirectly to the overall goal of the intervention. As a result, even though the DMI does not seem to have a specific deterrent effect, the intervention's focus on the targeted offenders is still warranted. For example, results from this study suggest that law enforcement follow-up may be working as intended with respect to prohibited offenses. Contrary to what was hypothesized, offenders in the DMI were re-arrested faster for committing prohibited offenses. This can be thought of as a success for the overall goal of the intervention – improving the community – since offenders thought to be driving the crime problem who are not complying with the program were arrested quickly.

Additionally, findings from this study suggest that the deterrence message delivered at the call-in and other elements introduced at that time like the idea of family and community support are not having the intended effect on the targeted offenders. If, as stated earlier, delivering the deterrence message in front of the community has more of a negative connotation for offenders, DMI officials should consider alternative ways to deliver the message while still

having a forum similar to a call-in. The true function of the call-in may not be to deter the individual offenders, it may be to get the members of the community more involved and invested in facilitating a change. In High Point, the community organization that offers services to offenders, High Point Communities Against Violence, was borne out of the DMI. To be effective the DMI requires strong community buy-in and in the end, the most visible aspect of the DMI to the community is the actual call-in meeting (Rivers, Norris, & McGarrell, 2012). Corsaro and Brunson (2013) suggest that the reason the intervention had no effect on crime rates in Peoria was the lack of community awareness and involvement in the program. Ultimately, community involvement is an important aspect of the DMI. DMI officials and community members recognize that "…the intervention's success is contingent on addressing community disorganization and reestablishing levels of informal social control and collective efficacy necessary to prevent the drug market from reemerging in the target neighborhood" (Rivers, Norris, & McGarrell, 2012, pg. 71). The call-ins are a way to increase collective efficacy by empowering communities to mobilize and exert informal social control (Sampson, Raudenbush, & Earls, 1997). Corsaro et al. (2012) suggested that effects of the High Point DMI may be wearing off at the community-level. A community forum similar to a call-in may be needed to keep community members invested.

Although this study indicates that the DMI did not have the expected specific deterrent effect on the targeted offenders, there is some evidence that continuing the focus on individual offenders contributes to the overall program goals. Once components of the intervention such as family involvement, social services, enforcement consequences, and perceptions of the call-in and deterrence message are examined directly, researchers will have a better idea of how to

improve individual-level effects of the DMI while at the same time disentangling the community-level and individual-level effects of the program.

APPENDIX

APPENDIX

High Point Police Department Prohibited Offenses for the Drug Market Intervention

Armed Robbery
Arson 1st & 2nd Degree
Assault Attempt to Inflict Serious Injury
Assault ISI
Assault ISI on LEO, School Official or State Employee
Assault by Pointing a Gun
Assault on a Handicapped Person
Assault with a Deadly Weapon on LEO, School official or State Employee
AWDW for Escape
AWDWISI
AWDWIKISI
AWDWWITKISI
Assault with intent to commit rape
Common Law Robbery
Deadly Weapon on State Property
Death by Duel
Discharging Firearm into Property
Felony Fleeing to Elude Arrest
Homicide
Intentional Death of Patient
Involuntary Manslaughter
Involuntary Manslaughter 2nd Offense
Kidnapping 1st & 2nd Degree
Kidnapping/Abduction
Malicious Castration
Malicious Maiming
Manslaughter
Manslaughter 2nd Degree
Murder 1st & 2nd Degree
Possession of Weapon of Mass Destruction
Possession of Firearm by Minor
Possession of Machine Gun
Possession of Weapon on Campus/School Property
Riot & Civil Disorders
Robbery
RWDW
Possession with Intent to Sell/Distribute
Trafficking any Amount of Drugs

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