THE IMPACT OF GANG INVOLVEMENT, TATTOO PRESENCE, AND A NEW DIVERSION PROGRAM ON JUVENILE RECIDIVISM OUTCOMES

by

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ABSTRACT OF THE DISSERTATION

The impact of gang involvement, tattoo presence, and a new diversion program on
juvenile recidivism outcomes

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Approximately one million juveniles under the age of 18 are arrested by law

enforcement agencies in the U.S. every year, according to recent Bureau of Justice

Statistics estimates (Hockenberry & Puzzanchera, 2017). Youth who have been arrested

at least once are more likely to be arrested again (Caudill, 2010); yet, relative to the adult

literature on recidivism, much less is known about juvenile recidivism. Although there is

a large literature on risk for juvenile arrest, some key factors associated with juvenile

delinquency are not often studied in the context of recidivism. For example, tattoos have

been used as indicators of gang involvement and risk behavior among adolescents

(Roberts & Ryan, 2002; McGloin, 2005), but little is known about whether tattoos are

relevant to juvenile recidivism. And although there are currently over one million

juvenile gang members in the United States (Pyrooz & Sweeten, 2015), and gang

involvement is associated with juvenile recidivism (Benda, Corwyn, & Toombs, 2001;

Spooner, Pyrooz, Webb, & Fox, 2017), there are no national estimates of arrest or

recidivism rates for gang-involved juveniles. This dissertation investigates the linkages

between tattoo presence, gang involvement, and recidivism in a medium-sized

northeastern city. It further examines the role of gang involvement on the effects of a

voluntary pretrial diversion program aimed at reducing recidivism among youth offenders.

I first examined the extent to which gang involvement and tattoos influence recidivism using data obtained from juvenile arrest records from 2014-2017 (N=1,008; ages 10-17; 82% male; 86% nonwhite). Of those juveniles who were arrested for the first time, approximately 13% were gang involved (N=128). Tattoo possession significantly differed by gang involvement, such that tattoos were more common among gang youth (81%) than among youth with no gang involvement (35%). While controlling for gang involvement, tattoo presence significantly predicted re-arrest. Youth with tattoos had 162% greater risk of general re-arrest within 12 months compared to youth without tattoos. Youth in gangs had a 67% greater risk of general re-arrest within 12 months compared to non-gang youth. Tattoos that are more likely to be associated with gang involvement (located on the head, neck, face, and hands) did not have any effects on recidivism, relative to other tattoos. Understanding the influence of gang involvement and tattoo presence on youth offending has many important implications for how serious problem behavior among youth is addressed by the justice system.

In the second part of the dissertation, I examined the impact of referral to and engagement in a voluntary diversion program on recidivism outcomes. Although about 10% of youth who met referral criteria were gang-involved, only 14% of youth fully engaged in services, none of whom were gang-involved. The results show that youth who were referred to services, but did not actively participate in services, were less likely to be re-arrested within three months compared to youth who were not referred to services. However, referral to services did not have an impact on recidivism outcomes for the

small number of gang-involved youth. This dissertation further highlights barriers to engaging justice-involved youth and their families to services, particularly youth involved in gangs. Interventions aimed at helping high risk youth offenders must carefully consider individual risk factors which affect youth and address the challenges to engagement that may prevent the initiation of necessary services.

PREFACE

This dissertation is original work by the author, J. Kubik. A version of Preliminary Study 1 has been published as Kubik, Docherty, Boxer, Veysey, & Ostermann (2016), and a version of Preliminary Study 2 is currently under review as Kubik, Docherty, & Boxer. All tables and figures are the author's own work, and all data was used with permission from investigators.

ACKNOWLEDGMENT

TABLE OF CONTENTS

CHAPTER 1

Introduction

Most recent data show that in 2014, one million juveniles under the age of 18 were arrested by law enforcement agencies in the U.S. (Hockenberry & Puzzanchera, 2017). Half of all juvenile arrests included larceny-theft, simple assault, drug abuse violations, and disorderly conduct offenses (Sickmund & Puzzanchera, 2014). Unlike recidivism rates for adult offenders, much less is known about trends in juvenile recidivism. There is no national recidivism rate for juveniles because of variation in how recidivism is defined, reported, and measured across various states (Sickmund & Puzzanchera, 2014). Although there are detailed estimates of the number of juvenile arrests that law enforcement agencies make in a given year on a national scale, there are no such estimates for the number of crimes committed. Thus, it is not known how many of these juvenile arrests include the same offenders – a measure that is needed in order to accurately determine recidivism.

Research shows that youth who engage in delinquent behavior and have been arrested once are more likely to be arrested again (Caudill, 2010). One recent study on recidivism that included young adult offenders released from state prison indicated that a large majority of offenders (i.e., 77%) were rearrested within five years (Durose, Cooper, & Snyder, 2014). More specifically, of those who were rearrested within five years of release, about 84% of inmates were 24 years old or younger, about 79% of inmates were between 25-39 years old, and about 69% of inmates were 40 and over (Durose et al., 2014). Recidivism is most common during adolescence and young adulthood, after which there is a general decrease in the percentage of recidivism with age (Piquero et al., 2007).

Youth involved in gangs may be at risk to enter the pathway of delinquent behavior that leads to repeated arrests and eventual incarceration during adulthood (Caudill, 2010). A meta-analysis of 179 empirical studies and 107 data sets determined that gang membership is consistently and significantly related to offending (Pyrooz, Turanovic, Decker, & Wu, 2016). Gang-involved youth consistently report higher levels of involvement in both violent and non-violent delinquency (Esbensen & Huizinga, 1993; Taylor, Peterson, Esbensen & Freng, 2007) and are more likely to have been either victims of, or witnesses to violence (Li et al., 2002; Peterson, Taylor & Esbensen, 2004). Peterson and colleagues (2004) found that a higher percentage of youth in gangs reported violent victimization compared to their non-gang counterparts (75% and 51%, respectively). In another study, youth involved with gangs reported committing 69% of all violent crimes and 82% of more serious crimes (e.g., assault, robbery), despite comprising only 31% of the total sample (Thornberry, Krohn, Lizotte, Smith, & Tobin, 2003). In addition, gang involvement appears to be increasing each year; the National Youth Gang Survey revealed a 15% increase in gang activity from 2006 to 2012, with an estimate of 850,000 gang members and 30,700 active gangs in the U.S. (Egley, Howell, & Harris, 2012).

With the exception of homicides, law enforcement agencies do not regularly record offenses as "gang related;" thus, we also do not have national estimates of gang-related arrests. However, when compared to their non-gang counterparts, studies have shown that gang-involved youth recidivate more often and sooner upon release from juvenile detention facilities (Caudill, 2010). Relative to the adult literature on recidivism, less is known on juvenile recidivism, especially in regard to gang-involved youth.

Recidivism data are useful, as they can be used to examine the impact of new intervention programs and changes in offender characteristics that influence juvenile outcomes. Still, there are very few evidence-based prevention and intervention programs that have shown successful outcomes for gang-involved youth (Boxer & Goldstein, 2012; Pyrooz, Decker, & Fleisher, 2011; Thornberry, 2010). However, intervention programs which target common risk factors for delinquency may reduce the likelihood of involvement in both gangs and criminal re-offending (Peterson & Morgan, 2014). Differentiating juvenile offenders in terms of gang involvement can also help to determine differential impacts of specific youth intervention programs and services

This introduction is followed by Chapter 2 which includes a review of the current literature, beginning with common factors that influence recidivism and involvement in gangs and ending with interventions for gang-involved youth. In Chapter 3, I introduce two preliminary studies conducted prior to my dissertation study. One study examines victimization during the period of youth involvement in gangs while the other examines maltreatment as a risk factor before youth gang involvement occurs. Chapter 4 begins with Dissertation Study 1, in which I investigate the influences of gang involvement and tattoos presence on recidivism. In Dissertation Study 2, I examine the impact of a voluntary diversion program on recidivism outcomes. This dissertation concludes with Chapter 5, a discussion and final conclusions, including limitations and policy implications.

CHAPTER 2

REVIEW OF THE CURRENT LITERATURE

Development of antisocial behavior and gang involvement among youth

In order to examine the factors that influence recidivism, we first need to understand the factors that lead to antisocial behavior in youth. Several factors have been shown to be predictive of delinquency in youth. There is consensus in developmental research that individual characteristics and behavior in early childhood (i.e., aggression, drug use, truancy, problem behavior and low educational achievement) predict later delinquency in adolescence and young adulthood (Stouthamer-Loeber & Loeber, 1988). Most importantly, an early age of onset of problem behavior or delinquency is associated with escalation into more serious problem behavior later on in early adulthood (Tolan, Gorman-Smith, & Loeber, 2000). This chapter begins with a review of the most common theoretical explanations used to describe the development of antisocial behavior in youth over time. Next, it clarifies victimization and maltreatment as key risk factors for involvement in gangs. Next, it describes specific characteristics associated with recidivism, such as gang involvement and tattoo possession. It ends with an overview of the impact of diversion programs and interventions aimed at reducing recidivism among first time youth offenders and gang-involved youth.

Longitudinal analyses from the Pittsburgh Youth Study (Loeber et al., 1993) have found that there are three pathways that lead to the development of problem behavior in youth. Findings show that boys from two cohorts, ages 9-13 and ages 13-25, typically followed distinct pathways of less to more serious problem behavior from childhood to adolescence (Loeber, Pardini et al., 2005). According to Loeber & Burke (2011), the first

pathway, *authority conflict pathway*, occurs prior to the age of 12 and includes stubborn behavior, followed by defiance/disobedience and later, authority avoidance (i.e., truancy, running away from home). The second pathway, *covert pathway*, occurs prior to age 15, begins with minor covert acts (shoplifting and lying), followed by property damage, (i.e., vandalism and fire-setting) and moderate delinquency (i.e., fraud), and later, serious delinquency (i.e., auto theft and burglary; Loeber & Burke, 2011). The third pathway, an *overt pathway*, begins with minor aggression such as bullying, followed by physical fighting and eventually, severe violence (i.e., rape, murder; Loeber & Burke, 2011). These three pathways represent individual differences that evolve over time. For each pathway, less serious problem behaviors occur first, followed by more serious behaviors. Understanding these developmental pathways can be useful in assessment and interventions, specifically when behaviors are linked to serious outcomes. For instance, recognizing that a youth might be on a particular pathway towards delinquency and implementing an intervention at a key developmental turning point might prevent the chances that a serious crime or injury will occur, and in turn might help the youth by diverting the pathway towards a more prosocial experience.

Analysis from 1,500 youths from the National Youth Survey found that direct exposure to delinquent peers was a stronger predictor of youth's self-delinquency than the influence of peers' attitudes of delinquency or attachment to peers (Agnew, 1991; Warr & Stafford, 1991). Several studies on youth delinquency have shown evidence of delinquent peers having strong effects on criminal behavior. For example, Thornberry et al. (1994) found that youth who engage with delinquent peers are more likely to be delinquent themselves. The authors propose a model that combines aspects from two

dominant theories of crime: control and social learning theory. Burgess and Akers (1966) posited that social learning theory relies on operant conditioning, where definitions favorable to crime are learned through direct imitation (modeling of social responses by others) to an individual's behavior. Delinquent behavior is sustained through the process of differential reinforcement, which provides rewards and punishments for criminal acts. Definitions favorable to crime are learned through this process of differential reinforcement and, in turn, influence behavior. Delinquent peers have a strong effect on delinquency, which operates both directly and indirectly on the pro-criminal definitions of crime through these processes of social learning and social control (Thornberry et al., 1994). The socialization model argues that delinquent peers and delinquent beliefs lead youth to engage in delinquent behavior, while the selection model argues that associations with delinquent peers and delinquent beliefs are a result of problem behavior (Thornberry et al., 1994). In general, self-control theory is consistent with the gang selection model, implying that youth with low self-control will select into gangs (Fox, Ward, & Lane, 2013). Both the socialization and selection models have causal influences on one another over time, suggesting a model that includes both might be best, termed the enhancement model (Thornberry et al., 1994). The enhancement model has also been used as an explanation for gang membership, when applied to youth gang members. Studies show that even peripheral association with a gang, for example, having friends in a gang, can increase involvement in delinquent behavior (Curry, Decker & Egley, Jr., 2002).

Most research on gang involvement suggests similar risk factors for delinquency and engagement in gangs (Esbensen, Peterson, Taylor & Freng, 2009). For example, the

enhancement model suggests that youth who already have a propensity for delinquent behavior are more likely than others to join gangs and increase their involvement in antisocial activity through gang activity (Thornberry, Krohn, Lizotte, Smith, & Tobin, 2003). In Boxer et al. (2015), authors found that gang-involved youth showed higher levels of risk on indicators of both individual risk factors (e.g., problem behavior, externalizing behavior, and risk-taking propensity) and contextual/community risk factors (e.g. peer deviance, caregiver knowledge of youth behavior, victimization, neighborhood violence, and neighborhood disorder). Within the individual domain, engaging in delinquent behavior in the past (Thornberry et al., 2003) and having more negative life events (Klein & Maxson, 2006) is associated with a higher risk of being involved in a gang. At the community level, compared to their non-gang counterparts, youth involved in gangs are typically at higher risk of violence exposure, as both witnesses and victims of violence (Taylor & Esbensen, 2004; Esbensen, Winfree, He & Taylor, 2001). Exposure to risk factors such as weapon carrying (Lizotte et al., 1997; Lizotte et al., 2000; Watkins, Huebner, & Decker, 2008), lack of parental monitoring, and aggressive behavior (Emmert et al., 2018) have been associated with gang involvement in early adolescence and an increase in subsequent gang-related violence (McDaniel, 2012). The Seattle Social Development Project suggests that youth join gangs as a result of early initiation of individual problem behaviors, involvement with antisocial peers, poor academic performance, and antisocial influences in neighborhoods (Esbensen et al., 1993; Hill, Lui, & Hawkins, 2001; Klein & Maxson, 2006). Some studies suggest that internal factors such as the need for protection and close friends in gangs, as well as external factors such as financial incentive and opportunities to spend time with gang

peers, are associated with gang involvement (Pyrooz & Decker, 2011; Melde et al., 2012).

It is important to note that there is no universally accepted conceptual and operational definition on what constitutes gang involvement (Bjerregaard, 2002; Curry, Decker, & Pyrooz, 2013; Howell & Griffiths, 2018). Among law enforcement, gang definitions may vary by local jurisdictions; however, most commonly, gangs are defined by their involvement in criminal activity (Curry, Decker, & Pyrooz, 2013; Curry & Decker, 1998) and affiliation with a specific territory (Curry, Decker, & Pyrooz, 2013; Thrasher, 2013). Among gang researchers, self-nomination by individuals generally has been accepted as an appropriate, robust measure of gang affiliation status (Esbensen, Winfree, He, & Taylor, 2001). Those who consider themselves to be members of gangs are also more likely to engage in delinquent activities compared to their non-gang counterparts (Bjerregaard, 2002; Thrasher, 2013).

Several pathways and theoretical explanations can be used to describe how youth, and gang involved youth specifically, develop antisocial behavior and continue to persist in that behavior. Particularly during adolescence, youth who have been arrested once are more likely to be re-arrested and spend time in detention (Caudill, 2010). In addition, compared to their non-gang counterparts, gang youth in particular are at most risk of having multiple arrests during the lifetime (Caudill, 2010). Since much less is known about juvenile recidivism in general, this dissertation examines the risk factors that influence youth to reoffend. The preliminary studies for this dissertation assess maltreatment as a risk factor before youth gang involvement occurs and victimization during the period of youth involvement in gangs. The dissertation study further examines

the role of gang involvement and tattoos as risk factors in producing persistence of offending by assessing recidivism among a community sample of high risk and gang involved youth.

Victimization and gang involvement

The first preliminary study that set the foundation for this dissertation examines victimization as a key risk factor for gang involvement. In general, gang-involved youth report higher rates of both violent and non-violent antisocial behavior, as well as victimization by violence, relative to their counterparts who are not involved with gangs (Barnes, Beaver, & Miller, 2010; Taylor, Peterson, Esbensen & Freng, 2007). The experience of violent victimization has long been acknowledged as a critical driver of gang affiliation, while also serving as a significant risk factor for a wide array of mental health difficulties including depression, anxiety, substance use, and problem behavior (Barnes et al., 2010; Boxer & Sloan-Power, 2013). The link between violent victimization risk and delinquent offending is well established (Esbensen & Huizinga, 1997; Lauritsen & Laub, 2007; Lauritsen, Sampson, & Laub, 1991; Loeber, Kalb, & Huizinga, 2001; Shaffer & Ruback, 2002). Because gang involvement is generally characterized by engagement in delinquent or criminal behavior, it is not surprising that gang youth report more victimization than do their non-gang peers (Barnes et al., 2010; Esbensen & Huizinga, 1993; Esbensen, Winfree, He & Taylor, 2001; Howell, 2012, Pyrooz, Moule, Decker, 2014). Using data from the National Youth Survey, Lauritsen, Sampson, & Laub (1991) reported that youth involvement in delinquent behavior was the strongest predictor of youth victimization, mediating the effects of demographic characteristics.

Other studies focusing on the relationship between gang membership and victimization indicate that gang-involved youth consistently report higher levels of involvement in both violent and non-violent offending (Esbensen & Huizinga, 1993; Taylor, Peterson, Esbensen & Freng, 2007) and are more likely to have been both victims of and witnesses to violence (Li et al., 2002; Peterson, Taylor & Esbensen, 2004). For example, Peterson and colleagues (2004) found that a higher percentage of youth in gangs reported violent victimization compared to their non-gang counterparts (75% and 51%, respectively). Taylor and colleagues (2007) also have shown that gang members were significantly more likely than non-gang youth to experience violent victimization. Most recent research by Pyrooz, Moule, and Decker (2014) revealed that gang members were more than twice as likely as non-gang members to be both victims and offenders, after controlling for low self-control, adherence to street codes, and routine activities. This study explained the unique position of gang members within this victim-offender overlap. The authors found that gang members were not distinctly either offenders or victims, but instead, gang membership was determined to be a common source of this overlap between victim and offender (Pyrooz, et al, 2014).

Although several studies report greater levels of victimization among gang-involved youth (Barnes, Boutwell, & Fox, 2011; Childs, Cochran, & Gibson, 2009; Fox, Lane, & Akers, 2013; Katz, Webb, Fox, & Schaffer, 2011), no studies have addressed the issue of whether the relation between gang involvement and victimization depends on the context in which victimization takes place (Gibson, Swatt, Miller, Jennings, & Gover, 2012). In addition, few studies have examined how the experience of victimization among gang-involved youth may differentially lead to negative outcomes compared to

non-gang-involved youth. Most recent statistics show that approximately 18% of US schools report gangs are present at their schools and 16% report that gang activities have occurred at their schools (Robers, Kemp, Rathbum, Morgan & Snyder, 2014). Though little is known about the relative impact of school versus community victimization, a few studies have explored victimization among gang members in schools.

In general, gang members in schools are victimized at much higher rates than are other students (Gottfredson & Gottfredson, 2001; Taylor, et al., 2007). Interestingly, Estrada and colleagues have found that gang membership was not directly associated with school violence victimization (Estrada, Gilreath, Astor, & Benbenishty, 2013; 2014), and that the likelihood of victimization increases when gang members engage in other forms of risk behavior, such as truancy, substance use, and involvement with risky peers. In addition, youth who have been victimized and/or engaged in delinquency in the past, may experience labeling and further stigmatization by other peers in schools (Becker, 1963; Sampson & Laub, 1997). The challenge with these studies is that they utilize school-based samples, which may exclude some gang-involved youth who may be less likely to attend school due to truancy or dropping out (Gibson et al. 2012). An absence from school may be correlated with either gang membership or victimization. Truancy may also increase the likelihood of youth arrest in the community (Monahan, VanDerhei, Bechtold, & Cauffman, 2014).

In the first preliminary study of this dissertation, I examine the moderating role of gang involvement on the context (school vs. community) and impact of victimization. By employing a high-risk sample of youth, this study does not introduce sample-selection bias into the relationship between gang involvement and victimization. Similar to

victimization in schools, little is known about the influence of school arrest specifically on future re-arrest. However, studies have shown that being suspended or expelled from school increases the likelihood of arrest within the same month (Costenbader & Markson, 1998; Monahan, VanDerhei, Bechtold, & Cauffman, 2014). In my dissertation studies, I further examine the influence that initial school-based arrests have on future arrests among another high risk sample of youth from the community.

Effects of childhood maltreatment on gang involvement

The second preliminary study for this dissertation examines maltreatment experiences during childhood as a risk factor for gang involvement later in adolescence. Many studies have shown that maltreatment experiences in childhood are linked to antisocial behavior, aggression and violence, and overall delinquency in adolescence and young adulthood (Dodge, Bates & Pettit, 1990; Holt, Buckley, & Whelan, 2008; Kerig & Becker, 2015; Hussey, Chang, & Kotch, 2006; Maas, Herrenkohl, & Sousa, 2008;). Exposure to maltreatment during childhood poses risks for a variety of specific problem outcomes in later adolescence such as drug and alcohol use (Mason, Russo, Chmelka, Herrenkohl & Herrenkohl, 2017; Oshri, Sutton, Clay-Warner, & Miller, 2015; Shin, Miller, & Teicher, 2013; Smith & Thornberry, 1995), externalizing problems (Van Wert, Mishna, & Malti, 2016), impulsivity (Oshri et al., 2015) and depression (Hussey, Chang, & Kotch, 2006; Wolfe, Scott, Wekerle, & Pittman, 2001). Yet, little is known about whether childhood experiences with maltreatment increase the likelihood of gang involvement later in development.

Depending on the type of maltreatment youth have experienced during childhood, the outcome may vary once youth reach adolescence. For example, experiences of

neglect may have very different outcomes than physical abuse over time. In a study that examined the impact of maltreatment on academic performance, youth who were physically abused showed the most discipline problems, while neglected youth presented with the poorest outcomes on academic performance (Eckenrode, Laird, & Doris, 1993). Relative to physically abused youth, youth who have been neglected tend to exhibit poorer academic performance and more limited peer interactions (Hildyard & Wolfe, 2002). Thus, the type of maltreatment youth experienced during childhood can impact the type of mental and behavioral health outcomes that youth exhibit in adolescence.

The link between maltreatment experience during childhood and its impact on youth outcomes in adolescence can be explained using Gottfredson and Hirschi's (1990) self-control theory. According to Gottfredson and Hirschi's (1990), self-control in children is established by effective parents who monitor, recognize, and punish their children's behavior appropriately. Self-control is established in early childhood (by ages 6-8) when effective parenting is most critical. In addition, effective child rearing is more likely when parents are attached to their children. Gottfredson and Hirschi (1990) would argue that parents with low attachment, which includes but is not limited to neglect and abuse, do not monitor their children's behavior and do not appropriately punish their children. These children will have low self-control, which is directly attributed ineffective parenting. Thus, according to self-control theory, youth with maltreatment experiences in childhood will establish low self-control that will continue to have an impact on their behavior throughout adolescence and beyond into adulthood. Self-control

theory may be one explanation why youth with maltreatment experiences may be more likely to join gangs in adolescence.

The maltreatment and gang involvement link may also be explained by another theory. Social learning theory suggests that youth who have been physically abused will imitate violent behavior they experienced during childhood and seek out acceptance among groups that also use violence and aggression to solve conflicts (Bandura, 1977; Akers, 1994). This idea has been substantiated in extensive work by Patterson (e.g., Patterson, DeBaryshe, & Ramsey, 1989) and Dishion (e.g., Dishion, McCord, & Poulin, 1999) on deviance training in antisocial peer networks.

Although maltreatment is a risk factor for a variety of problem behaviors, including antisocial behavior and delinquency, there is a lack of research on whether maltreatment is also a specific risk factor for gang involvement. While youth who have been physically abused might be more likely to have discipline problems in schools and/or exhibit externalizing problem behavior, it is not known if they would be more likely to also join gangs. In addition, youth who have experienced neglect as a form of maltreatment might be more likely than other youth to join gangs due to their limited peer interactions and lack of a supportive network. The gang is a group that provides youth with a social and emotional support network. When the option of a more positive and prosocial alternative network may be restricted or not available, the gang network can serve as a means of providing continued support for youth's social and emotional needs (Pyrooz, Sweeten & Piquero, 2012).

In his ethnography on the Fremont Hustlers gang in Kansas City, Fleisher (1998) describes chronic abuse and neglect as a lifestyle theme among youth gang members and

their families – increasing the risk of further gang involvement among generations of families in the Fremont community. Lauger (2012) made similar observations through his ethnographic research with gang-involved youth in Indianapolis, noting especially that their backgrounds of significant parental neglect led them to seek social and emotional support from their gang. Thornberry et al. (2003) showed that boys with substantiated maltreatment records during childhood had a greater likelihood of becoming gang involved in the future. On their sample of middle school youth, Thompson and Braaten-Antim (1998) found that youth who experienced both physical and sexual abuse were about four times more likely to participate in gangs than youth who did not experience maltreatment.

Since only a few studies have examined the influence of maltreatment on gang involvement, the second preliminary study for this dissertation questions whether different types of maltreatment experiences can lead to involvement in gangs. This preliminary study is important in understanding the underlying mechanisms that may lead to gang involvement in the first place, and will provide additional support for one of the hypotheses in my dissertation study, whether youth in gangs are more likely to recidivate compared to non-gang youth. The impact of maltreatment and its effects beyond childhood also carry important implications for the development of programs targeted to prevent youth gang involvement and reduce violent problem behaviors in general.

Characteristics associated with recidivism: Gangs and tattoos

Although there is a large literature on risk factors associated with gang involvement, certain risk factors are not often studied in the context of juvenile recidivism. In general, tattoos have been used as indicators of risk-taking propensities in

adolescents and young adults (Roberts & Ryan, 2002; McGloin, 2005), yet we do not know the impact of tattoos on juvenile recidivism. In an analysis of the National Longitudinal Survey of Adolescent Health Public Use Dataset, tattoo possession significantly predicted violent behavior, substance abuse, and school problems among a nationally representative sample of 6,072 adolescents (Roberts & Ryan, 2002). Using this same dataset on a sample of 13,101 adolescents, Silver, VanEseltine & Silver (2009) found that substance use and engaging in crime were significant causal predictors of tattoo possession later in adulthood. In another sample of 484 adolescents ages 12-22 attending a primary care clinic, participants with tattoos and/or body piercings were more likely to report engaging in risk-taking behaviors and at greater degrees of involvement in violent behavior than those without either (Carroll, Riffenburgh, Roberts, & Myhre, 2002). In another study in which college students rated themselves on risky behaviors, compared to non-tattooed students, males with tattoos reported having more sexual partners and were more likely to have an arrest record, while females with tattoos were more likely to report drug use and shoplifting (Drews, Allison, & Probst, 2000). Jennings, Fox, & Farrington (2014), found that the link between tattoos and criminal offending is only correlational, not causal, suggesting that tattoos can be considered a symptom of developmental risk factors and personality traits that are related to both tattooing and criminal involvement. It may be that, due to these underlying traits, youth with tattoos are more likely participate in risky and deviant behavior, including affiliating with peers in gangs and committing criminal acts.

Similar to its explanation of the link between maltreatment and gangs, self-control theory can also be used explain the link between tattoos and other risky behaviors.

According to Gottfredson and Hirschi (1990) self-control is the most important individual-difference cause of crime and delinquency. Unlike social controls which vary, self-control is developed early in life and relatively stable over time. For example, an individual with low self-control will always have a greater propensity to be impulsive, risk-seeking, and engage in delinquent behavior, than an individual with high self-control. Gottfredson and Hirschi (1990) would argue that youth with tattoos have low self-control, compared to youth who do not engage in risk seeking type of behaviors. This theory may explain why youth with tattoos might be involved in gangs in and/or committing crimes and vice versa.

Studies on adult prison inmates have also found links between tattoos and risk of recidivism. Inmates with tattoos are more likely to have a history of violent behavior, substance abuse, and childhood problems (Birmingham, Mason, & Grubin, 1996). Rozycki Lozano, Morgan, Murray, & Varghese (2011) studied a sample of 81 inmates with prison tattoos, 75 inmates with non-prison tattoos, 52 non-tattooed inmates, and 66 tattooed college students to test whether inmates with prison tattoos are at greater risk of reoffending than non–tattooed inmates and tattooed college students. The results suggest that inmates with prison tattoos score higher on recidivism risk assessments than inmates without prison tattoos and tattooed college students. This would suggest that tattoos might be influential in offending persistence. Waters (2012) expanded upon Rozycki Lozano et al. (2010) and examined a larger set of 79,749 inmates released from detention over a six year span. Findings show that inmates with visible tattoos were more likely to be reconvicted for new felony offenses and new violent offenses within three years.

Tattoos have also been used as indicators of gang involvement as part of official police determination procedures (Katz, Webb, & Schaefer, 2000; McGloin, 2005), as well as criteria to indicate gang presence in in prisons (Fong & Buentello, 1991; Phelan & Hunt, 1998). In a survey of 181 Texas prison officials, 97% of respondents used gang-related tattoos as indicators of gang affiliation (Fong & Buentello, 1991). In addition, studies have found that tattoos on the face, head, neck or hands suggest a stronger commitment to criminal gang life (Etter, 1999; Phelan & Hunt, 1998). Although less common than in prisons, gang tattoos have also been used as indicators of gang presence in schools (Chandler, Chapman, Rand, and Taylor 1998; Stryuk, 2006). Compared to several other indicators (i.e., having a gang name, spending time with gang members, and gang clothing, violence, graffiti), gang tattoos were one of the least frequently used indicators. Only 37% of students used gang tattoos as an indicator compared to 80% who used gang name to indicate gang presence in schools (Chandler et al., 1998). Similar to offending behavior, this relationship between gang involvement and tattoos is likely correlational, not causal. It is important to note that youth with tattoos might draw more attention to law enforcement, if tattoos are associated with gang involvement and vice versa. This might be especially true if the tattoos are visible; for example, located on the face, neck, head, arms, etc. Having a visible tattoo might increase the chances of an arrest if youth behavior is more carefully scrutinized by law enforcement.

Although a number of studies have examined the relation between tattoos and risk taking behavior, the relationship between tattoos and juvenile recidivism has not been given as much attention. In the UK, Farrington's (1991) research found a positive association between tattoo possession and reoffending risk among both adolescent and

adult males. In Australia, Putnins (1997; 2002) found a higher prevalence of tattoos

among a young offender sample, compared to a high school sample, yet the presence of

tattoos did not increase the risk of recidivism among youth in detention. Thus, findings

are mixed and this relationship has yet to be explored on a U.S. sample of juvenile

offenders. The first dissertation study examines whether tattoos at first time arrest predict

future juvenile offending in a U.S. sample. In addition, it also validates visible tattoos on

the head, face, and neck as predictors of gang involvement. It is important to investigate

the potential linkages between tattoos, gang involvement, and recidivism, to determine

not only whether or not the presence of tattoos is relevant to juvenile recidivism and gang

involvement, but also whether or not the type of tattoos and/or placement of tattoos

matters. After addressing the key risk factors related to recidivism, one might question

what can be done to reduce these risk factors and prevent recidivism. The following

section provides a review of diversion programs which provide support to youth in

mitigating risk factors associated with arrest and re-directing their behaviors.

Impact of diversion programs on antisocial behavior development

Studies on the development of youth violence and antisocial behavior suggest that

once youth are involved in committing lower-level violent offenses, they are likely to

escalate into more serious offenses in the future (Loeber, 1982). Detention might actually

encourage, rather than deter, low-level offending youth from committing future crimes

(Holman and Ziedenberg 2007; Lubow 2005; Ogle & Turanovic, 2016). Detention can be

overly punitive for adolescents, resulting in poorer mental health and behavioral

outcomes in adulthood (Barnert et al., 2017; Holman & Ziedenberg, 2007). Compared to

adult offenders, adolescents are also less developed in managing their emotions and

behaviors, less mature in judging risk, more impulsive, and more susceptible to negative peer influences (Dahl & Spear, 2004; Moffitt, 1993; Scott & Steinberg, 2008). Adolescents are thus, highly amenable to change, and can respond well to treatment and rehabilitation (Dahl & Spear 2004). The goal of diversion is to remove youth from the traditional punitive justice system and provide non-sanction alternative programs (Ray & Childs, 2015). Interventions delivered as diversion programs can be effective in diverting minor offenses away from the court system and thus preventing future offending (Beck, Ramsey, Lipps, & Travis, 2006; Cocozza et al., 2005). Diversion programs can include a variety of rehabilitation interventions, such as individual and/or family therapy, community service, and drug treatment (Walby, 2008), and aim to reduce the number of juveniles within the justice system, thus reducing the burden upon system resources (Mears et al., 2016; Patrick & Marsh, 2005; Ray & Childs, 2015). In addition, Patrick & Marsh (2005) found that the use of diversion programs was significantly less expensive compared to processing offenders through the traditional justice system.

One such diversion program is the implementation of civil citations across counties in Florida. According to the Florida Department of Juvenile Justice (2015), civil citation is a form of pre-arrest diversion, whereby law enforcement agencies use discretion to decide whether to formally arrest a juvenile or to present them with a citation directing them to contact a civil citation coordinator. Youth who commit misdemeanor offenses or municipal violations are eligible. Youth who receive a civil citation are then assigned to an intervention program by the coordinator (FDJJ, 2015). The most common intervention is community service; however, intervention programs can also include mental health counseling, substance abuse treatment, domestic violence

diversion, and family therapy (Walby, 2008). Youth who successfully complete their sanction/intervention program will avoid receiving a formal juvenile arrest record; a formal arrest record is processed for youth who do not complete the program (FDJJ, 2015). As with diversion programs, the intention of the Florida civil citation program is to divert youth from the justice system, reduce any stigma associated with a possible arrest record, and reduce future arrests.

Another diversion program, similar to civil citations in Florida, was developed in New Jersey in response to a directive from the attorney general in 2005. Law enforcement agencies in NJ were provided with guidelines on how to best handle first-time juvenile offenders who have committed minor juvenile delinquency offenses using a diversion program known as a stationhouse adjustment. According to the directive, the intent of the stationhouse adjustment program is to provide immediate consequences to the juvenile, such as community service, and a quick resolution for the victim (Harvey, 2005). The program also benefits the juvenile by avoiding the stigma of a formal juvenile delinquency record (Harvey, 2005). Once a juvenile offender is apprehended by a law enforcement officer for a first time low-level offense, instead of an arrest taking place, the juvenile, parent/caregiver, and the victim convene at the police stationhouse to discuss the offense. These meetings are handled and directed by law enforcement officers. When necessary, the juvenile offender is referred to services and/or makes restitution in some form. This process allows officers to resolve minor disputes without the need to file an official arrest charge with the court (Harvey, 2005). Although the directive was released to all law enforcement agencies in 2005, an American Civil

Liberties Union of NJ (2018) report determined that stationhouse adjustments remain severely underused across police jurisdictions.

This dissertation will determine recidivism outcomes for first time youth offenders who engaged in a new voluntary diversion program, which incorporates aspects from both civil citations and stationhouse adjustments in a higher-risk group of offenders, and aims to reduce the incidence of youth violence. This diversion program targets youth offenders who would have been precluded from the use of stationhouse adjustments due to the higher risk nature of their crimes. Many of these youth offenders may also be involved in gangs. The following section provides a review of current intervention programs for gang involved youth. Since very few intervention programs aimed at reducing recidivism among gang involved youth exist, this study further tests whether engagement in a diversion program after a first time arrest reduced subsequent re-arrest for any gang involved youth in the study.

Interventions for gang-involved youth

Research has found that suppression and deterrence based strategies enforced by law enforcement to remove gang members from communities can be considered effective in the short term, yet most gang members return to their communities (Boxer & Goldstein, 2012; Pyrooz, Decker, & Fleisher, 2011). Findings from Esbensen's et al. (2013) Gang Resistance Education and Training (GREAT) program evaluations showed an impact in decreasing rates of gang membership; however, the rates of criminal offending and violent behavior were not reduced (Pyrooz, 2013). Thus, Pyrooz (2013) suggests that when the odds of lowering gang memberships are unrelated to criminal offending, one must pause to question the main goal of gang prevention programs. No

evidence-based prevention and intervention programs have shown successful outcomes for gang-involved youth that meet the most stringent criteria for significant program effects put forward by the Blueprints Model (Henggeler & Schoenwald, 2011; Thornberry, 2010). Model programs must undergo a high quality program evaluation design and show that positive intervention impacts are sustained one year after the program intervention ends (www.blueprintsprograms.org). In addition, there is much less research focusing on the potential benefits of more rehabilitative and comprehensive interventions targeting gang members (Chacon, 2007; Fritsch, Caeti, & Taylor, 1999). Perhaps we must explore what works in some programs in order to confront this complex reality. Howell & Griffiths (2018) have identified approximately a dozen effective gang and gang-related programs, of which many are prevention and suppression programs, with only a handful being gang intervention programs. For programs to be considered effective, they must be implemented with sufficient fidelity and produce moderate outcomes in a high quality quasi-experimental evaluation (Howell & Griffiths, 2018).

In order to reduce recidivism among gang-involved youth, we must first focus on reducing the factors that lead to aggressive and delinquent behavior. One such evidence-based gang intervention is Aggression Replacement Training (ART), a psychoeducational program that consists of three main components: a structured learning training to teach social skills, anger control training to teach ways to manage anger, and moral education to help improve moral reasoning in youth (Bernfield, Farrington & Leschied, 2003; Glick & Gibbs, 2010). When tested with gang-involved youth in Brooklyn, NY, ART has shown positive results in reducing anger, aggression, and violence (Goldstein, 1994). It has also reduced arrest rates among its participants, who are recruited from the most

violent gang populations in their communities (Howell & Griffiths 2018; Goldstein, 1994). In addition, when the program is implemented correctly, it has reduced felony recidivism rates among program participants by 24% (Barnoski & Aos, 2004).

Another type of gang intervention, the Aggressive Behavioral Control (ABC) Program, has been evaluated as an effective program by the National Gang Center. This high intensity cognitive behavioral program, which follows the risk, need, and responsivity principles (Andrews & Bonta, 2003), reduced recidivism and major institutional misconduct in a sample of 160 offenders (Di Placido, Simon, White, Gu, & Wong, 2006). This treatment can reduce gang violence in both correctional institutions and in the community. Studies show that both treated gang members and other high-risk offenders recidivate significantly less in a two year follow-up when compared to non-treated controls (Di Placido et. al., 2006). Interventions such as ART and the ABS program provide the benefit of reducing violent and antisocial behaviors that are exhibited by many gang members and high-risk offenders in general.

Multisystemic Therapy (MST; Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009) is an evidence-based intensive family- and community-based intervention model that addresses multiple aspects in each youth's and family's ecology that contribute to problem behavior. While MST has shown success with reducing youth antisocial behavior in youth with serious delinquent conduct (Henggeler & Schoenwald, 2011), it is less effective when applied to gang-involved youth in particular. For example, gang-involved youth were significantly less likely than were uninvolved youth to complete a course of MST (Boxer, 2011; Boxer, Kubik, Ostermann, & Veysey, 2015). However, youth identified as gang-involved were still more likely than not to show

success, except at rates significantly lower than uninvolved youth (Boxer, Kubik, Ostermann, & Veysey, 2015). Successful MST course completion in these studies was defined as remaining engaged in a full course of treatment (approximately 3-4 months) and meeting individual treatment goals; this initial success in treatment can lead to lasting positive behavioral changes (Boxer et al., 2015). In a follow-up study examining the longer-term (12 months post-discharge) arrest outcomes of youth enrolled in MST services, no significant differences in recidivism were observed between gang-involved and non-gang youth (Boxer, Docherty, Ostermann, Kubik & Veysey, 2017).

Brief Strategic Therapy (BSFT; Szapocznik, Scopetta, & King, 1978) is another intervention program developed for youth with serious problem behavior that has demonstrated evidence of success among gang-involved youth. BSFT is a short-term family-treatment program aimed to reduce behavior problems such as drug use, sexual risk behaviors, and delinquent behaviors (Szapocznik, Schwartz, Muir, & Brown, 2012). An adapted version of BSFT family therapy that incorporated the cultural values of Hispanic groups and included gang diversion and awareness training for adolescents was tested on a sample of 200 adolescents and their families (Valdez, Cepeda, Parrish, Horowitz, & Kaplan, 2013). Among youth and their families who engaged in the program, alcohol use among youth declined and parents' report of youth behavior – conduct, impulsivity, and hyperactivity – improved (Valdez, et al., 2013). This adapted version of BSFT has shown to be an effective intervention among gang-involved youth in a very high risk community.

In their systematic meta-analysis of studies evaluating comprehensive gang programs, Hodgkinson et al. (2009) found that key features of effective intervention

programs in reducing crime outcomes include an intervention team, community involvement, case management personalized to individual offenders, and expertise sharing among agencies. The review was based on studies that reported crime reduction outcomes (e.g. crime rates, arrests, and court appearances) and also met quality criteria using the Maryland Scale of Scientific Methods (Sherman et al, 1998). All the interventions mentioned above include these key features and have had some positive outcomes in reducing problem behavior among gang-involved youth. Another study found that youth who engaged in a multiple-family-group-intervention program for first time juvenile offenders were less likely to reoffend compared to youth who were only placed on probation (Quinn & Van Dyke, 2004). More interestingly, the study included an intent-to-treat model which included all youth who were referred to the program, regardless of whether or not participated in treatment. Youth who were referred to the program, but did not attend all program sessions, were still less likely to reoffend compared to the probation group (Quinn & Van Dyke, 2004). Thus, referral and/or partial engagement in an intervention program might be enough to steer some youth away from future engagement in crime. By examining the relationship between youths' opportunity to complete a voluntary diversion program and recidivism outcomes, this dissertation will investigate whether offering services to youth and their families might be a signal to youth that those in authority care about them, and that the system is trying to help rather than punish them. Further, diversion programs that target common factors for gang and non-gang offenders may reduce youths' likelihood of involvement in both gangs and violence (Peterson & Morgan, 2014). This dissertation will examine if the mere existence of such an intervention program targeting common factors might be enough to divert

youth from further engagement in delinquency and multiple arrests. It will further

differentiate offenders in terms of gang involvement to determine differential impacts of

the intervention.

CHAPTER 3

PRELIMINARY STUDIES

This dissertation aims to document the effects of gang involvement on juvenile recidivism and behavioral outcomes. I will first introduce two preliminary studies that have set a foundation for my dissertation study. In the first study, I examined the moderating role of gang involvement on the context and impact of victimization. This study was a cross-sectional design with retrospective report that used a sample of youth referred by the justice system for intensive home- and community-based treatment of problem behavior. This study examined the nature of the relation between gang involvement and violent victimization in street and school contexts. In the second study, I examined the impact of childhood maltreatment on adolescent gang involvement. This study used a prospective longitudinal design with a sample of maltreated youth in contact with protective services to examine how differential experiences of maltreatment might impact future gang involvement.

Preliminary Study 1: Gang Involvement on the Context and Impact of Victimization

Within the criminology literature, most work has focused on gangs and gang members in communities, whereas limited studies have explored the associations between gang involvement and victimization across varying contexts. This study examines the nature of the relation between gang involvement and victimization in both street and school contexts. For gang-involved youth in particular, the school context might not pose a great threat for victimization, but the risk of victimization associated with gang involvement might be particularly heightened in contexts outside of school. This study considers the following research questions: First, do gang-involved youth and

non-gang youth differ in their rates of victimization? Based on the current literature, I

predict that gang-involved youth will experience higher rates of victimization than non-

gang-involved youth. Next, does the association of gang involvement with victimization

depend on the context in which the victimization is taking place? I further predict that the

effect of gang involvement will vary by the context of victimization, i.e., street versus

school. In particular, I hypothesize that gang involvement will predict victimization in the

street context, but not in schools. Finally, does gang involvement moderate the

association between victimization and behavioral and mental health outcomes? I

hypothesize that the experience of victimization will be positively associated with several

behavioral/mental health issues for gang-involved youth, but not for non-gang-involved

youth.

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

Participants

  Participants were recruited from a large, non-profit organization which provides

Multisystemic Therapy (MST; Henggeler, Schoenwald, Borduin, Rowland, &

Cunningham, 2009), an intensive family- and community-based intervention model

addressing multiple aspects of youth problem behavior. Youth in the sample were

referred by the local justice system for treatment of their problem behaviors and recruited

directly at their respective agency sites. These referral problem behaviors typically

include but are not limited to gang involvement, criminal offending, substance use,

negative peer involvement, non-compliance with family rules, academic problems,

aggressive behavior, and runaway behavior (see, e.g., Boxer, 2011). Therapists provided

MST services to youth and their families in seven sites in the following eastern US states:

Connecticut, Florida, Georgia, Maryland, New Jersey, Pennsylvania and Rhode Island. The MST sites varied from rural to urban settings. Caregivers were also involved in MST services and provided consent for treatment.

Participants in this study were 421 youth (69% male; mean age = 15.08 years, SD = 1.32; 38% Black/African-American, 18% Latino/a, 34% White, 10% other).Youth participants were aged 11-18, per guidelines of MST services (Henggeler et al., 2009). This age group also has been identified as most at risk for gang affiliation (Rizzo, 2003). From this high-risk sample of youth, 227 youth (60%) were identified as being victimized at least once in the last year. Of the victimized youth, 51 (13.4%) were victimized in the street only, 49 (12.9%) were victimized at school only, and 54 (14.2%) were victimized both in the street and at school. From the total sample, 94 (22.3%) youth were identified as gang-involved.

Measures

Gang involvement. Gang involvement was measured via five different indicators using a measure that has been supported by previous research (see Boxer, Veysey, Osterman, & Kubik, 2015). First, 3 items from the youth survey measure: "Have you ever been a gang member?" "Are you now in a gang?" and "[Have you] been involved in gang fights?" The first two items were dichotomous (yes/no) and the last item utilized a frequency scale that was dichotomized (yes/no) for ease of application. Gang research suggests self-nomination as an appropriate, robust measure of gang affiliation status (Esbensen, Winfree, He, & Taylor, 2001). Two additional indicators of gang involvement were drawn from participants' clinical records: whether gang involvement in any form was part of a youth's presenting problems or referral issues (see Boxer, 2011); and

whether gang involvement in any form was identified during treatment as a contributor to a youth's problem behaviors. The referral indicator was typically determined during the intake phase of treatment, whereas the contributor indicator might have been determined at any point during active treatment. However, the vast majority of determinations were made during the first couple weeks of treatment (Boxer et al., 2015). Both of these data points were based on therapists' exchanges with families, typically through direct inquiry or naturally arising during the course of assessment and treatment. Youth were classified as "gang-involved" if any of the five indicators were affirmative (see Boxer et al., 2015). The mean time to discovering gang involvement among cases classified as gang-involved was 8.33 days (SD=8.63), with a median of six days and a range spanning zero days (i.e., determined at intake) through 31 days; in 75% of these cases, gang involvement was discovered in under two weeks' time.

Victimization. Youth reported on their prior-year violent victimization in school and in the neighborhood via six items (three describing street victimization, three describing school victimization) taken from the assessment measures used in the Gang Resistance Education & Training (GREAT, Esbensen & Osgood, 1999) evaluation study. Youth respondents were asked: Have any of the following things happened to you in the last year? How many times in the last year have you: 1) Been hit by someone trying to hurt you in your neighborhood or on the street [in school]?; 2) Had someone use a weapon or force to get money or things from you in your neighborhood or on the street [in school]?; and 3) Been attacked by someone with a weapon, or by someone trying to seriously hurt or kill you in your neighborhood or on the street [in school]?). Frequency responses ranged from never (0) to twelve or more times (12). This variable was censored

at 12. Scale scores were the mean of all items (α=.77) and were utilized in the regression models. For descriptive analyses, scores were dichotomized (any victimization = "yes"; none = "no") for ease of application.

Youth problem behavior. Youth reported their involvement in deviant, antisocial, or aggressive behavior on a 16 item scale adapted from the GREAT battery and drawn initially from the Denver Youth Survey (Huizinga, Esbensen & Weiher, 1991). Items included measures of both violent (e.g., attacked someone with a weapon) and nonviolent (e.g., illegally spray painted a wall or a building) forms of delinquency. Youth first were asked to indicate whether they engaged in any forms of problem behavior during the year prior to assessment, and if so, how many times along the following scale: one time (1), two times (2), three times (3), four times (4), or five or more times (5). Scale scores were the mean of all items (α =.89). Two composite variables were further deduced from this scale: minor problem behavior (skip class, lie about age, avoid paying for things, property damage, weapon carrying, theft <$50, theft >$50, burglary, hitting to hurt someone, and selling pot; α =.86) and serious problem behavior (auto theft, attack with weapon, robbery, shot at someone, sold hard drugs; α =.83; see Boxer, Docherty, et al., 2014).

Internalizing problems. General internalizing (e.g., anxiety, depression, and somatic problems) were measured via youth reports on the Youth Self Report (YSR; Achenbach & Rescorla, 2001). This measure is a rater-specific version of a well-established standardized clinical rating scale measure of emotional and behavioral symptoms normed for use with youth in the sample age range. The YSR provides internally reliable syndrome scores for internalizing problems (α = .90). Youth indicated

whether each of 32 items are not true (0), somewhat or sometimes true (1), or very true or often true (2) for their behavior during the six months prior to test. Scale scores were the mean of raw item scores. Raw means of item scores on the YSR symptom clusters are typically used for inferential analyses.

Substance use. Alcohol, tobacco, and marijuana use were measured by youth self-reports on the World Health Organization's Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST; WHO, 2002). The first item was a dichotomous (yes/no) measure indicating whether youth ever used a particular substance at least once in their lifetime. The next three items utilized a frequency scale that measured the desire for and problems associated with substance use over the past three months on the following scale: not at all (1), once or twice (2), weekly (3), monthly (4), or daily or almost daily (5). The last two items asked whether friends have ever shown concern due to substance use and whether substance use was ever controlled or stopped by the user, on the following scale: No, never (0), Yes, in the past three months (1), Yes, but not in the past three months (3). ASSIST scores represent indexes of substance use risk status, and as such, internal reliability estimates are not necessarily valid (see Streiner, 2003).

Procedures

All procedures were reviewed and approved by the university Institutional Review Board overseeing the project, as well as by the host agency. Youth were enrolled consecutively in the study over a 13-month period as they entered services with the host agency. Survey measures were administered to youth and their caregivers as part of a larger intake battery during which therapists collected information necessary to evaluate treatment needs and formulate initial treatment plans. Data were transmitted

anonymously to the research team via scanned and emailed survey images or FAX transmissions. Clinical record data also were extracted and coded anonymously prior to inclusion in analysis datasets.

Results

Means, standard deviations, and ranges for all study variables are presented in table 1.1 and bivariate correlations are in table 1.2. I first examined victimization frequencies as the function of gang involvement. Several chi-square tests of independence were performed to examine the relation between victimization and gang variables. The relation between total victimization and gang involvement was significant, χ^2 (1) =23.26, p<.001. Approximately 62% of gang youth were victimized in school and/or street contexts, compared to only 34% of non-gang youth. The relation between street victimization and gang was also significant, χ^2 (1) =4.69, p=.030. Approximately 20% of gang youth were victimized only in the street context, compared to 11% of non-gang youth. The relation between both street and school victimization was significant, χ^2 (1) =25.06, p<.001. Approximately 30% of gang youth have been victimized in both the street and at school, compared to 9% of non-gang youth. Finally, the relation between school only victimization and gang was not significant. Overall, the rates of victimization in street only versus school only seemed to differ more for gang youth (20% versus 12%, respectively) than for non-gang youth (11% versus 13%, respectively).

We next estimated ordinary least-squares (OLS) and censored (tobit) regression equations to predict the impact of gang involvement on types of victimization. I ran these two different models to get a precise estimate of the relationship between the variables because the victimization indicator data were right-censored at 12, and for the tobit

models the victimization outcome represents the maximum number of times a youth experienced any type of victimization (e.g., getting hit, robbed, or attacked) in that context. For both OLS and tobit regressions, separate models were run for each type of victimization. The outcome variable for the first model was total victimization, followed by street victimization and school victimization. The regressors for all models included gang involvement (uninvolved = 0, involved = 1), age, gender (male = 1, female = 0), and ethnicity (nonwhite = 0, white = 1). All coefficients reported are standardized.

For the first linear regression model, [$F_{(4, 386)}$ =4.56, p=0.001, R^2=.05], gang involvement (β=.22, SE=.12, p<.001) emerged as a significant predictor of total victimization, such that total victimization experiences increase with youths' involvement in gangs. For the second model [$F_{(4, 382)}$ =5.81, p<.001, R^2=.06], gang involvement (β=.23, SE=.12, p<.001) also significantly predicted street victimization. For the third model [$F_{(4, 384)}$ =2.78, p=.03, R^2=.03], gang involvement (β=.17, SE=.14, p=.001) significantly predicted school victimization. For all models, gender, age, and ethnicity were not significant. The variance inflation factor test was less than two for all models, indicating that they did not exhibit multicollinearity. Regression error specification tests indicated that the all three models did not suffer from misspecification. Complete results are presented in Table 1.3.

For the first tobit model [$F_{(4, 367)}$ =3.53, p=.008, Pseudo R^2=.01], gang involvement (β=.50, SE=.13, p<.001) was a significant predictor of total victimization. For the second model, with street victimization as the outcome variable, [$F_{(4, 371)}$ =4.83, p<.001, Pseudo R^2=.02] gang involvement (β=.51, SE=.14, p<.001) was significant. For the third model, with school victimization as the outcome variable, [$F_{(4,}$

378) =2.18, p=.071, Pseudo R^2=.01], gang involvement (β=.40, SE=.14, p=.006) was significant. For all models, age, gender, and ethnicity were not significant. Results are presented in Table 1.3.

On average, youth involved in gangs have a higher probability of total victimization than youth who are not gang-involved (15.5 probability points; p<.001). Similarly, gang-involved youth have a higher probability of street victimization (17.6 probability points; p<.001) and school victimization (13.7 probability points; p=.007) than non-gang youth.

In order to further examine whether the experience of victimization may be a risk factor for behavioral/mental health issues for gang-involved youth, I ran five sets of moderated multiple regression analyses (Aiken & West, 1991; Holmbeck, 2002). The first step of each regression model included demographic control variables of age, gender, and ethnicity. The second step added gang involvement and the hypothesized moderator variables, school victimization and street victimization; these moderators are continuous measures of victimization. The third step added interaction terms created by multiplying gang by each of the two hypothesized moderators. Continuous predictors were centered before inclusion in analyses to reduce multicollinearity and aid in interpretation. Standardized coefficients are reported below.

For internalizing problems, main effects sustained in the final model were observed for sex (female, higher internalizing scores, β=-.41, p<.001) and ethnicity (white ethnicity, higher internalizing scores, β=-.11, p=.024). No main effects of gang or victimization and no moderator effects were observed. For minor problem behavior, main effects sustained in the final model were observed for age (older youth, more minor

problem behavior, β=.17, p<.001), ethnicity (white ethnicity, more minor problem behavior, β=-.14, p=.003), gang involvement (gang youth, more minor problem behavior, β=.22, p<.001), and street victimization (more street victimization, more minor problem behavior, β=.25, p=.005). No moderator effects were observed. Results are presented in table 1.4.

For the model predicting serious problem behavior, main effects were observed for sex (males, more serious problem behavior, β=.09, p=.040) and gang involvement (gang youth, more serious problem behavior, β=.23, p<.001). Two moderator effects were observed, jointly accounting for a modest (ΔR²=.091) and significant (p<.001) incremental increase in variance accounted for in serious problem behavior. Gang involvement interacted significantly with both school victimization (β=.31, p<.001; Figure 1.1) and street victimization (β=.22, p=.025; Figure 1.2). Post hoc probing of these effects revealed that for gang- involved youth, there was a significant positive relation between serious problem behavior and school victimization (β=.41, p<.001), as well as serious problem behavior and street victimization (β=.30, p<.001). However, for non-gang-involved youth, there was no relationship between serious problem behavior and school victimization (β=-.04, p=.594) or serious problem behavior and street victimization (β=.05, p=.546). Results are presented in table 1.4.

For marijuana use, main effects were observed only for age (older youth, more marijuana use β=.20, p<.001). No main effects of gang or victimization and no moderator effects were observed for the final model predicting marijuana use. For tobacco use, main effects were observed for age (older youth, more tobacco use β=.27, p<.001), ethnicity (white ethnicity, more tobacco use β=-.35, p<.001), and gang involvement (gang youth,

more tobacco use β=.10, p=.040). No moderator effects were observed. For alcohol use, main effects were observed for age (older youth, more alcohol use, β=.11, p=.026) and ethnicity (white ethnicity, more alcohol use, β=-.14, p=.006). One moderator effect was observed, accounting for a modest (ΔR²=.021) and significant (p=.014) increment in variance accounted for in alcohol use. School victimization interacted significantly with gang involvement (β=.21, p=.024; Figure 1.3). Post hoc analyses revealed that for gang-involved youth there was a significant positive relation between alcohol use and school victimization (β=.30, p=.006), but there was no significant relation for non-gang-involved youth (β=.00, p=.954). Table 1.5 includes results for all substance use risk factors.

Preliminary Study 2: Impact of childhood maltreatment on adolescent gang involvement

Maltreatment, in particular neglect and physical abuse, appears to have a meaningful association with gang involvement. However, more research clearly is needed. Using a longitudinal design, more robust indicators of maltreatment, and a larger sample than previous studies, this study disambiguates the influences of specific maltreatment types on youth involvement in gangs. I explore these issues through analysis of data from the LONGSCAN (Longitudinal Studies of Child Abuse and Neglect) project (Runyan et al., 1998). Because very few studies have examined gang involvement in the context of maltreatment in general, by computing chi-square analyses and oneway ANOVAs with gang as the grouping variable, I first establish the validity of the measure of gang involvement by examining differences across gang- and non-gang-involved youth. I hypothesize that weapon carrying, externalizing behaviors, and peer

fighting will be more common among youth with some gang involvement than among

non-gang-involved youth, and that they will be greatest among youth involved in a gang

at more than one time point. Next, using multinomial logistic regression models this

study examines how differential experiences of maltreatment up to age 10 influence

adolescent gang involvement from ages 12 to 18. I further hypothesize that exposure to

maltreatment, and especially neglect and physical abuse, during childhood will increase

the likelihood of gang involvement during adolescence.

Methods

Design and procedures

Longitudinal Studies on Child Abuse and Neglect (LONGSCAN) is a consortium

of research studies under common procedures, including five different data collection

sites, which each conducted a separate research project on the etiology and impact of

child maltreatment (Runyan et al., 1998). The LONGSCAN dataset is archived by the

National Data Archive on Child Abuse and Neglect (NDACAN) and includes

information on youth from birth through 18 years of age. All data were provided to the

investigators as anonymized data directly from the NDACAN. The five study sites were

located in different regions of the United States: the South, the East, the Midwest, the

Northwest, and the Southwest. These sites were chosen to ensure that results would not

be specific to a unique location or agency, and to sample youth at different levels of risk

for maltreatment and in different areas, for example, urban vs. suburban. Individual site

consent, assent, and related human subjects protocols were approved by the local

Institutional Review Board (IRB) for each site. Approval from the Rutgers IRB was

granted to the investigators to initiate analyses in the service of project goals. The current

analyses are based on pooled data from these sites. Previous studies utilizing data from the LONGSCAN consortium also incorporated data from all five sites and sources (Martinez-Torteya, Miller-Graff, Howell, & Figge, 2015; Yonas et al., 2010).

Recruitment procedures and inclusion criteria varied slightly by site. At each site, a sample of children, who had either been maltreated or were at risk for maltreatment by age 4 or younger, was recruited by child protection service workers. Youth considered as "at risk of maltreatment" were recruited from clinics serving children from low-income, inner-city neighborhoods; classified as at risk by the state public health department's infant tracking program due to extreme poverty, young maternal age, single parenthood, and low birth weight; or classified as at risk by Child Protective Services offices following a report for child maltreatment. Informed consent was obtained from the parents/caregivers. These data were collected through comprehensive assessments of children, as well as measures completed by their parents and their teachers, which were completed at ages 4, 6, 8, and 12 years. Data collection measures were self-completed by the youth only at ages 12, 14, 16, and 18. To reduce social desirability bias and other potential problems with interview effects, youth and their caregivers participated separately in interviews administered by trained researchers. Previous publications using the LONGSCAN dataset have discussed procedures regarding sampling and inclusion criteria (Runyan & Litrownik, 2003, Runyan et al., 1998). More information can also found at https://www.ndacan.cornell.edu/.

Participants

The LONGSCAN dataset provides an opportunity to measure the mental and behavioral health concerns of youth who were specifically referred to child protective

services, most of whom reported a maltreatment event. Data for this study focus on youth

from the LONGSCAN dataset who responded to measures related to gang involvement,

which were first asked at the age 12 interview. The total sample pooled across all five

sites includes 1354 youth (51.48% female; 73.85% non-white). For the currently study,

611 are retained for analyses after employing listwise deletion on study variables. The

proportion of females in the sample was 52.21%. The race of youth in the sample was

55.65% black, 23.73% white, and 20.62% other. Youth who were asked questions

related to gang involvement were between the ages of 10 and 17. This age group has been

identified as most at risk for gang affiliation (Rizzo, 2003). The mean actual age at the

age 12 interview was 11.98 in the estimation sample and 12.33 in the rest of the total

sample, and these differences were significant (t (1084) =9.76, $p<.001$). The mean count

of any maltreatment was 1.83 in the estimation sample and 1.98 in the rest of the total

sample, and these differences were not significant (t (1352) =1.18, $p=.238$).

Measures

> **Maltreatment.** Maltreatment events were coded according to the NIS-2

classification system, originally developed for the Second National Incidence Study

(National Center on Child Abuse & Neglect, 1988; Sedlak, 2001). Based on official CPS

narratives, research staff coded each report as either having no maltreatment event, or

having any of the following seven types of maltreatment events: physical abuse; sexual

abuse; emotional abuse; physical neglect; educational neglect; emotional neglect; and

other maltreatment. Physical neglect is a dichotomous measure which includes lack of

supervision and failure to provide from birth to age 10. Multiple reports could be

compiled per year, so that a youth could have more than six events reported in the same

year. Counts of each maltreatment event type were used as predictors in the analyses.

Raters were trained on the coding scheme until they achieved at least 90% agreement

with the correct classification codes on a set of training vignettes. Inter-rater reliability

for classifications was generally good, although raters were somewhat less reliable in

coding emotional abuse and neglect. Kappas for codes from the allegations narratives

ranged from .58 - .88 (M = .77). With the exception of one category (emotional neglect)

all Kappas were above .70. Only maltreatment events up to age 10 are included in this

analysis because gang involvement was assessed at interviews at ages 12, 16, 18. Any

maltreatment events after age 10 would overlap with the gang involvement outcome.

Gang involvement. Gang involvement was measured via two different indicators

using a survey item that has been supported by previous research (see Boxer et al., 2015).

For interviews at ages16 and 18, one item was used from the self-report survey measure

that was adapted from the Denver Youth Study (Huizinga, Esbensen & Weiher, 1991):

"[How many times in the last year have you] been involved in gang fights?" This item

utilized a frequency scale: never (=0), one or two times (=1), between three and nine

times (=2), and 10 or more times (=3). This scale was further dichotomized (yes/no, with

affirmative responses indicating gang involvement). For age 12, one item was used from

the self-report survey measure that was adapted from the CHAMPS Study (Black,

Laliberte & Santelli, 1999): "[In the past year,] did you ever take part in gang activities?"

This item was dichotomized (yes/no). A gang involvement variable was calculated in this

study to differentiate youth who have been involved in a gang only at one time point

(transient gang) compared to those who have been gang involved at multiple time points

(stable gang) (see Table 2.1 for variable proportions by maltreatment). From this high-

risk sample of youth, approximately 28% of youth were involved in gangs at some point during adolescence; about 23% reported being in a gang during one wave, 5% reported being in a gang at two different waves, and 0.5% reported being in a gang at all three waves. Due to small cell sizes, the latter two groups were collapsed to categorize youth as having stable gang involvement if they reported gang involvement in two or more waves. Bivariate correlations are displayed in Table 2.2. The maltreatment variables are all highly correlated with each other.

Weapon Carrying. For age time point 12, one item was used from the Adolescent Delinquency self-report survey that was adapted from the CHAMPS Study (Black, Laliberte & Santelli, 1999): "[Have you ever] carried any kind of weapon (such as a gun, razor, or knife)?" This item was dichotomized (yes/no). For age time points 16 and 18, one item was used: "How many times in the last year have you carried a hidden weapon?" This item utilized the following frequency scale: never (=0), one or two times (=1), between three and nine times (=2), and 10 or more times (=3). I then dichotomized this item so that it indicated either no weapon carrying (0) or carried a weapon at least once (1) in the last year.

Peer Fighting. To assess the extent to which friends of youth engage in risky behaviors, one item was used from a project developed self-report survey item: "[How many of your close friends] get into fights?" This item utilized the following frequency scale: none of my friends (=0), some of my friends (=1), and most of my friends (=2). This measure was only asked at age 12 and 16 interviews.

Externalizing Factors. General externalizing (delinquency and aggression) were measured via youth reports on the Youth Self Report (YSR; Achenbach and Rescorla,

2001). This measure is a well-established standardized clinical rating scale measure of emotional and behavioral symptoms normed for use with youth ages 11-18. Youth indicated whether each of 32 items are not true (=0), somewhat or sometimes true (=1), or very true or often true (=2) for their behavior during the six months prior to testing. This measure utilized the sum of raw item mean scores on the delinquency and aggression scales. Raw means of item scores on the YSR symptom clusters are typically used for inferential analyses. Externalizing factors were only measured at ages 12 and 18.

Demographic information. Youth and caregivers responded to questions assessing key demographic characteristics, including age, race, and gender. Race was dichotomized into White (=0) or Non-white (=1). The non-white category includes Black, Hispanic, Native American, Asian, mixed race and other.

Results

Validating measures of gang involvement

In order to assess the validity of this study's gang involvement variable, I computed chi-square analyses and oneway ANOVAs. I assessed the unadjusted differences between gang involved and non-gang involved groups during each age time point (age 12, 16, and 18) and across the following study variables: weapon carrying, externalizing factors, and peer fighting, focusing on the statistical significance of differences. Then, post-hoc comparisons determined differences among the three groups: non-gang, gang during one wave (transient), and gang across more than one wave (stable). I used Tukey's Honest Significant Difference (HSD) for mean differences in externalizing factors, and Bonferroni-corrected chi-square analyses for weapon carrying and peer fighting. My hypothesis was that transient and stable gang youth would have

higher levels of problem outcomes than would the non-gang youth, and additionally that stable gang youth might have higher levels of outcomes than transient gang youth. The results of these analyses are displayed on Table 2.3.

Overall, 6% of the sample carried a weapon at age 12, 16% at age 16, and 18% at age 18. I used a chi-square test with an alpha of 0.05 to determine if there was a relationship between level of gang involvement and weapon carrying. An alpha of .017 was used for each of the three post-hoc comparisons in order to adjust for an inflated familywise error rate. For age 12, there was a statistically significant association between weapon carrying and level of gang involvement, χ^2 (2) = 26.65, p < .001, V = .22, such that weapon carrying was more common among youth with stable gang involvement (25.81%) than among youth with transient gang involvement (8.49%; p = .010) and youth with no gang involvement (3.87%, p < .001). However, youth with transient gang involvement and non-gang-involved youth did not significantly differ (p = .045). For age 16, the chi square test also indicated that there was a statistically significant association between weapon carrying and level of gang involvement, χ^2 (2) =71.47, p < 0.001, V = .35, such that stable gang (51.72%) and transient gang (40.19%) groups had higher levels of weapon carrying than non-gang (10.93%; both ps < .001), but the two gang groups were not different from each other (p = .265). Gang involvement also significantly predicted weapon carrying at age 18, χ^2 (2) = 96.18, p < .001, V = .41, such that each of the three groups significantly differed from each other: stable gang (75.86%), transient gang (38.53%), and non-gang (12.07%), all ps < .001.

Next, I conducted a chi-square analysis of peer fighting to examine differences by level of gang involvement. Overall, 35.61% and 43.73% of the sample at ages 12 and 16,

respectively, said that some of their friends got into fights, compared to 7.62% at age 12

and 11.78% at age 16 saying that most of their friends got into fights. A chi-square

analysis indicated that there was a statistically significant association between peer

fighting at age 12 and level of gang involvement, $\chi^2(4) = 46.75$, $p < .001$, $V = .20$, such

that transient (16.51%) and stable (22.58%) gang youth were more likely to say that most

of their friends got into fights than non-gang youth (3.66%), $ps < .001$. However, the two

gang groups did not significantly differ ($p = .659$). A similar pattern of results emerged

for peer fighting at age 16; a chi-square analysis indicated significant differences by gang

involvement, $\chi^2 (4) = 94.03$, $p < .001$, $V = .29$. Again, transient (29.63%) and stable

(46.67%) gang youth were more likely to say that most of their friends got into fights

than non-gang youth (6.16%; $ps < .001$), but were not significantly different from each

other ($p = .089$).

I computed an ANOVA for the externalizing factor scores at ages 12 and 18,

because these scores were continuous and relatively normally distributed. Externalizing

scores ranged from 0 to 52 at age 12 ($M = 9.98$, $SD = 7.15$) and from 0 to 45 at age 18 ($M

= 9.47$, $SD = 6.86$). Results of these analyses indicated that the means of externalizing

factor scores at age 12 ($F (2, 565) = 14.57$, $p < .001$, $\eta = .049$) and age 18 ($F (2, 494) =

32.11$, $p < .001$, $\eta = .115$) differed by level of gang involvement. Tukey's post hoc

comparisons for the outcome at each time point indicated that stable gang and transient

gang youth had greater externalizing problems than youth with no gang involvement ($ps

< .001$), but transient and stable gang youth did not differ from each other (both $ps >

.338$). Externalizing factors were not measured at age 16.

Association between childhood maltreatment and adolescent gang involvement

In order to examine the influence of experiencing different types of maltreatment on gang involvement, I computed multinomial logistic regression models. I rotated the base outcome (stable gang, transient gang, and non-gang) among these three groups of youth to report all three pairwise comparisons. I ran separate models for each of the maltreatment variables (maltreatment overall, neglect, physical abuse, sexual abuse, emotional abuse, and educational neglect), and all other covariates were identical across models. Separate models were estimated due to multicollinearity among the maltreatment predictors, particularly for emotional abuse. The covariates in each model included dummy variables for gender (male = 1) and race (non-white = 1). Table 2.4 presents the relative risk ratios for the maltreatment predictors in these models.

In the model testing the influence of any maltreatment overall on gang involvement, main effects were observed for stable gang youth suggesting that, on average, stable gang-involved youth had a greater number of any maltreatment records compared to both non-gang youth and transient gang youth. The models indicate that each maltreatment event experienced from birth to age 10 was associated with a significantly higher risk for being in the stable gang group, relative to being in the non-gang group (*RRR* =1.19, *p* =.013) and the transient gang group (*RRR* = 1.25, *p* = .005). Thus, each maltreatment event confers a 19% greater risk of stable gang involvement compared to no gang involvement, and a 25% greater risk of stable gang involvement compared to transient gang involvement. Figure 2.1 displays model predicted probabilities from the multinomial logistic regression. As the count of maltreatment events increases, the predicted probability of being in the stable gang group also increases, while the predicted probability of never being in a gang or having transient

gang involvement decreases. Table 2.1 includes descriptive statistics for the overall maltreatment variable.

In the model testing the influence of neglect on gang involvement, main effects were observed for stable gang-involved youth compared to transient gang youth. The models indicate that neglect is associated with a significantly higher risk for being in the stable gang group, relative to being in the transient gang group ($RRR = 1.34$, $p = .013$). Thus, each maltreatment event confers a 34% greater risk of stable gang involvement compared to transient gang involvement. As shown in Figure 2.2, on average, stable gang-involved youth have more neglect records compared to both transient gang-involved youth and youth who have never been in a gang. Table 2.4 presents the results of these models. In addition, youth who experienced neglect had 2.34 times of the risk of stable gang involvement ($p = .048$) compared to non-gang involvement. Prior experiences of sexual abuse, physical abuse, educational neglect, and emotional abuse did not have any significant influence on gang involvement.

Discussion

Preliminary Study 1 examined the associations between gang involvement and victimization in both street and school contexts among 421 youth referred for targeted home- and community- based intervention services by the justice system. The primary results from this study suggest that gang-involved youth experience higher levels of victimization than youth who are not involved in gangs, supporting the first hypothesis. Of the approximately 40% of youth in the sample who report being victimized at least once in the past year, 36% are involved in gangs, compared to 16% gang involvement among youth who do not report victimization. These findings are consistent with current

literature, which finds that gang-involved youth experience increased levels of victimization compared to non-gang youth (Barnes et al., 2010; Gottfredson & Gottfredson, 2001; McDaniel, 2012; Taylor, et al., 2007).

The findings suggest that the association of gang involvement with victimization depends on the context in which the victimization is taking place, partially supporting the second hypothesis. Chi-square analysis showed that gang- involved youth are more likely than non-gang youth to be victimized in the street. However, victimization rates for gang and non-gang youth are equivalent for school only victimization. The findings further suggest that gang involvement amplifies the impact of victimization on key outcomes, supporting the third hypothesis. Victimization in both street and school contexts increased the risk of serious problem behavior for gang- involved youth whereas victimization in schools increased the risk of alcohol use for gang-involved youth.

Experiences of victimization also appear to amplify substance abuse outcomes for gang-involved youth relative to non-gang youth. The results indicate that victimization experiences in schools in particular may increase alcohol use among gang-involved youth. Based on recent research (Estrada et al., 2013; 2014), other risk factors such as truancy, substance use, and involvement with risky peers may in fact be mediating the associations between gang involvement and street victimization. It might be that gang-involved youth spend less time in schools due to truancy and drug use, resulting in more time spent in their neighborhood with risky peers – thus supporting the finding that gang involvement significantly predicts street victimization (see Hill, Lui, & Hawkins, 2001; Maxson, Whitlock, & Klein, 1998; Thornberry at al., 2003). This conclusion is also consistent with Cohen and Felson's (1979) routine activities theory, suggesting that when

gang-involved youth spend less time in school and more time in the street in the absence of capable guardians, crime is more likely to happen. Consequently, gang-involved youth might have a greater likelihood of being victimized when not in school.

In preliminary study 2, I analyzed longitudinal questionnaire data collected on 611 youth to determine how childhood maltreatment influences gang involvement in adolescence. I categorized youth into three groups based on their response to gang involvement questions at ages 12, 16, and 18: no gang involvement, transient (at only one age) gang involvement, and stable (at two or three ages) gang involvement. This grouping was valid, as gang involved youth had higher levels of weapon carrying, externalizing, and peer fighting than did non-gang involved youth. Although the stable gang group was relatively small (5%) compared to the rest of the sample, this base rate mirrors the base rate of actual gang membership in the youth population. In another study, using self-reported data, Pyrooz and Sweeten (2015) estimated that in the U.S. in 2010, an average of 2% of youth ages 5-17 were gang members, with involvement peaking at age 14 when 5% were in gangs.

I next found that youth with any experiences of maltreatment in childhood were more likely to be in gangs over a longer period of time (i.e., stable gang involvement). The results of this study point to the impact of maltreatment on the risk of sustained gang involvement. It appeared ultimately that the effect of the overall maltreatment variable was largely driven by neglect. After differentiating the maltreatment types, physical abuse experiences alone during childhood did not significantly predict gang involvement. This finding is not in line with the assumptions of social learning theory, suggesting that maltreated youth will imitate violent behavior they experienced during childhood by

seeking out groups which also use violence to solve conflicts (Akers, 1994; Fleisher, 1998; Thompson & Braaten-Antrim, 1998). Youth who have had experiences of neglect in childhood were also more likely to be in stable gangs later in adolescence. Previous research has shown a mix of factors linked to maltreatment – including parental victimization (in the form of child abuse or neglect), poor parental monitoring, and weak parental attachments – are all strong predictors of gang membership (Howell, 2003; Howell & Egley, 2005; Thornberry et al., 2003). Importantly, these factors could be the byproducts of neglect and thus are consistent with the finding that neglect alone has a significant impact on gang involvement. The presence of stronger social and emotional attachments to gang networks in more stable gangs might account for these results. Neglected youth might also be inclined to join gangs due to factors such as lack of social support and lower self-esteem (Smith & Thornberry, 1995).

Future research could test whether these mechanisms mediate the neglect-gang involvement relationship and help understand why neglected youth are at greater risk for gang involvement. In contrast with Thompson and Braaten-Antim's (1998) study, in which prior experiences of physical and sexual abuse were strong predictors of delinquency and gang involvement, this study did not show such an effect. This may be due to the unique nature of this sample which included several cohorts of children at risk of maltreatment, whereas in the prior study, youth were not selected on the basis of their maltreatment risk history.

Despite the importance of these findings, there were some limitations in the studies. First, other factors may account for the non-influence of the other study variables. Research suggests that antisocial or problem behaviors are accounted for by

genetic, shared, and non-shared environmental influences (Bartels, et al., 2003). Although the models controlled for these factors by including demographic control variables, it is possible that other confounding factors may exist that could not be controlled for in this study, such as gang status over time. In Preliminary Study 2, the gang measure was also limited because it did not directly specify gang membership via self-nomination; instead the survey questions indicated youth involvement in gangs via gang fighting and gang activities. Further, the cross-sectional nature of the data in Preliminary Study 1 do not allow for the evaluation of causation. In addition, it is possible that the association of gang involvement with the victim-offender overlap (Pyrooz et al. 2014) might have been driving the effects found in the studies.

In addition, although maltreatment was differentiated by type in Preliminary Study 2, there are many other characteristics of maltreatment, such as severity, duration, context, and co-occurrence, which can alter its impact on youth (Belsky, 1980, 1993; Manly, Cicchetti, & Barnett, 1994). Although inter-rater reliability for classifications for maltreatment events was generally good, raters were less reliable in coding emotional neglect than the other maltreatment types. Because many of the samples of youth in this study were selected based on maltreatment history or risk, it is unclear whether these results would generalize to community samples. Finally, although using records of maltreatment has advantages, these youth could have been exposed to maltreatment that went unreported.

Despite these limitations, these findings highlight the presence of meaningful differences between gang-involved and non-gang-involved youth. Given the widespread presence of gangs, especially in urban neighborhoods, there is a great need for further

research to examine and evaluate how gang involvement, and certain factors that may be associated with gangs, shape youths' developmental pathways and future outcomes. Many juvenile first time offenders are released upon arrest and may not receive any type of services. Such work is necessary and critical in terms of developing more effective gang violence prevention and intervention programs in the community.

CHAPTER 4

CONCEPTUAL DESIGN, DATA, and METHODOLOGY

Overview of the dissertation research

Using data sources from the Newark Police Department, the dissertation study is comprised of two parts. *Study 1: Juvenile Recidivism* describes arrest rates for juveniles in a medium-sized northeastern city in the US, and investigates the role of gang involvement and tattoo presence in recidivism. Next, implementing a case control design, *Study 2: Case Study in Juvenile Diversion: COPY,* further examines the role of gang involvement on the effects of a voluntary pretrial diversion program aimed at reducing recidivism among first-time youth offenders.

The dissertation research analyzes recidivism outcomes and gang influence using arrest data obtained from the Newark Police Department and various statistical analyses in a stepwise fashion. *Study 1* is guided by these research questions: 1) Is gang involvement associated with both non-violent and violent (i.e., crime against a person) recidivism, net of other influential factors? 2) Do tattoos serve as valid indicators of gang involvement based on official law enforcement arrest records? 3) Can tattoos serve as predictors of juvenile recidivism? *Study 2* is guided by these general questions: 1) Does referral to services (the opportunity for treatment) decrease the likelihood of re-arrest? 2) Does engagement in services have an impact on arrest outcomes? I further examine gang involvement as a moderator of the relationship between eligibility for services and arrest.

Dissertation Study 1: Juvenile Recidivism

This study is a retrospective review of juvenile recidivism outcomes. Research shows that youth who have been arrested once are more likely to be arrested again (Caudill, 2010). This study will assess the extent to which factors, such as having an initial school-based arrest and prior arrests, influence youth recidivism. Since an arrest can lead to labeling and further stigmatization of youth (Becker, 1963; Sampson & Laub, 1997), I would expect that youth who have been arrested in schools and youth with prior arrests would be more likely to be arrested again. Since gang-involved youth in particular are at risk of having multiple arrests (Caudill, 2010), I would expect that gang-involved youth would be more likely to recidivate in general, and recidivate sooner, than their non-gang counterparts. For example, I would expect to see arrest differences between gang-involved and non-gang youth at six months out, but then not at 12 months out. I would also expect similar results for the associations between gang involvement and both general re-arrest and violent re-arrest, while controlling for school-based arrests and prior arrests.

The second part of this study asks whether tattoos can serve as valid indicators of gang involvement in a juvenile justice sample and whether they can predict juvenile recidivism. Since tattoos have been historically used to identify gang members (Chandler et al., 1998; Fong & Buentello, 1991), I would expect that they would also serve as indicators of gang involvement in my sample; however, not all tattoos in general would be equally indicative of gang involvement. I would expect only tattoos that characterize a commitment to gangs such as those on the face, neck, or hands would indicate gang involvement. Previous research has indicated that inmates with tattoos are at a higher risk

of recidivating that inmates without tattoos (Rozycki Lozano et al., 2010); thus, I

hypothesize that youth with any tattoos in the sample will also have a higher risk of

recidivism, even after controlling for gang involvement.

Sample

Data were drawn from de-identified juvenile arrest records (N=1,008; ages 10-18;

82% male; 86% black) obtained from the Newark Police Department. The dataset

contains 1,560 youth arrest records from January 2014-December 2017. Of the total

sample, 30% youth have been re-arrested at least once (n=303). Of the total sample, at

initial arrest youth with tattoos comprise of 27% (n=269) and gang-involved youth

comprise of 13% (n=128). Approximately 23% of the sample have had an arrest prior to

the study time period; this would include any arrest any time before January 2014

(n=234). Table 3.1 includes descriptive statistics of the gang and arrest variables.

Measures

Arrest/Recidivism. The date and offense type (i.e., property, violent crime, drug

offense, weapon) were recorded by police officers for all arrests during the recidivism

check period. With regards to recidivism, I received information on each arrest event

occurring between the initial arrest and the date exactly six months and 12 months after

the date of initial arrest during the study period. This information was gathered using

Newark Police Department Youth Aide Bureau data management system and entered into

a database for analysis. Using the arrest data, I classified each event as indicating a

violent arrest (i.e., a crime against a person) or a non-violent arrest, following guidance

from Rossi, Waite, Bose, & Berk (1974). Prior arrests are also included as a control

variable, as any arrest before the study time period began (January 2014).

Tattoos/markings. The type of marking (i.e., scar, tattoo) and location on body of markings (i.e., right shoulder, left arm) were recorded by police officers for all arrests. I first classified youth with tattoos using a dichotomous measure (yes/no). Because visible tattoos on the head, face, neck and hands have been characterized as indicating a strong commitment to gangs (Etter, 1999; Phelan & Hunt, 1998), I further categorized the location of these tattoos, as indicated in the police records, on a scale based on visibility: no visible tattoos (0); visible tattoos on the face/neck/hands (1); tattoos on any other body parts (2).

Gang involvement. Information regarding youth gang affiliation was obtained via self-report and official police record during initial arrest and first subsequent re-arrest. During arrest and processing, youth who self-reported as gang-involved were identified as gang affiliated. The police record determining gang affiliation was not based solely on tattoo identification. Youth with gang affiliation included the specific gang name and set name. Using the arrest data, youth with non-missing gang indication status at either initial or first subsequent re-arrest were classified using a dichotomous (yes/no) measure indicating whether youth had any gang affiliation.

Disposition. This measure includes information on the immediate outcome of the arrest. Upon arrest, youth may be released to their guardians/caregivers, or they are remanded to the youth detention center. They can also be assigned to court, where the court will decide their outcome on that given day. Whether youth are remanded, released, or assigned court depends on several factors, including the severity of the crime, the presence of a guardian, time of the crime, and whether or not youth had any prior arrests. This measure is categorized as follows: released (0), remanded (1), court (2). This

variable was not included in final dissertation analyses because of the ambiguity of the measure. Upon further assessment, it was not possible to delineate when youth were actually released home to their caregivers after they had been remanded in the youth detention center for some period of time. Some youth who were remanded may have been immediately released to their caregivers once in detention. The available data did not provide enough information for this variable to be a useful measure.

Initial school-based arrest. This measure includes whether or not the youth committed the first offense during school or on school property. This measure has been dichotomized as follows: school-based arrest (1) and not school-based arrest (0).

Demographics. This measure includes demographic information obtained at arrest (i.e., age, sex, and race). Race is dichotomized as non-black (0) and black (1). Black race includes African American (86%). Non-black race includes Hispanic, (12%), white (1%), and other (<1%). Sex is dichotomized as male (0) and female (1).

Procedure

All procedures were reviewed and approved by the university Institutional Review Board overseeing the project, as well as by the Newark Police Department. De-identified arrest data were transmitted anonymously to the research team via email transmissions.

Analytic approach

Using a series of logistic regression models, I will first examine prevalence of re-arrest during the six-month and one year periods following the initial arrest of all juveniles in the sample. In order to determine what factors influence recidivism, I will implement logistic regression models to determine whether gang involvement and other

covariates are associated with recidivism. All logistic models will utilize the same covariates: age, sex, race, prior arrest, and initial school-based arrest. Next, to determine the validity of tattoos as a proxy measure for gang involvement, I will run chi square and logistic regression analyses using tattoo possession at initial arrest to predict gang involvement. In order to determine whether the location of tattoos had differential impacts on gang involvement and recidivism, I will implement further chi square and logistic regression analyses. Finally, survival analyses will be performed predicting re-offense and time to re-offense, using the dichotomous measures of gang involvement and tattoos as risk factors. To analyze the time to re-offense variable, a Cox linear regression was performed.

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

Research Question 1: Is gang involvement associated with recidivism?

In the sample of 1,008 youth (82% male, 86% black race, mean age=15.6 years) who were arrested, 30% of youth have been re-arrested at least once (n=303). The first question to consider is whether gang-involved youth were more likely to be arrested than were non-gang youth during the six month period following initial arrest. The overall proportion re-arrested among the two groups (gang vs. non-gang) were significantly different (X^2=42.09, p<0.01, df=1, V = .26). Among gang-involved youth, the rate was 47% (44/92), whereas for non-gang youth, the rate was 17% (89/512). However, violent arrest rates among the two gang groups were similar (gang: 9/44, 20%; non-gang: 21/89, 24%), and not significantly different (X^2=0.17, p=.683, df=1, V = -0.03).

The second question to consider is whether the rates were different over a longer period of time; thus, I measured the rates across the groups over a 12 month period

following initial arrest. Similar to the six month period, the general arrest rates among the gang groups were significantly different (X^2=47.78, p<0.01, *df*=1, *V* = .27). Among gang-involved youth the rate was 56% (60/108), whereas for non-gang youth the rate was 23% (125/548). Again, violent arrest rates among the two gang groups were similar after one year (gang: 14/60, 23%; non-gang: 34/125, 27%), and not significantly different (X^2=0.32, p=.574, *df*=1, *V* = -0.04). Table 3.1 includes the descriptive statistics for all gang and arrest variables.

I next conducted logistic regression analyses with robust standard errors to determine the unique association of gang involvement with recidivism, after adjusting for demographic covariates in the model. I controlled for sex, age, race, prior arrest, and initial school-based arrest, and outcomes included both general and violent arrest at both time points- six months and 12 months after initial arrest. Gang involvement was coded 1 for gang-involved youth and 0 for non-gang youth. Table 3.2 includes odds ratios for all predictors in the models. The logistic regression model predicting general re-arrest at six months post initial arrest found that gang involvement (OR: 4.453, p<.001) and sex (more likely for males, OR: 0.485, p=.044) significantly predicted general arrest. Age decreased the odds of general re-arrest (OR: 0.846, p=.048). Having an initial school-based arrest also decreased the odds of general re-arrest by 53.3% (p=.022). Figure 3.1 displays the predicted probability of general re-arrest by gang involvement within 6 months.

After controlling for all covariates, the logistic regression at one year follow up after initial arrest showed a significant prediction of general arrests from gang involvement (OR: 4.666, p<.001) and sex (more likely for males, OR: 0.462, p=.016).

Both initial school-based arrest (OR: 0.407, p=.003) and age (decreased odds as age increases; OR: 0.81, p=.005) significantly decreased the odds of general re-arrest. Figure 3.2 displays general re-arrest differences by gang involvement within 12 months. For violent arrest, the gang variable was not a significant predictor at either six months (OR: 0.499, p=.346) or 12 months (OR: 0.562, p=.301).

The next question in this study was whether gang-involved youth were re-arrested sooner than were non-gang youth following initial arrest. I conducted survival analysis to determine if the survival curve to general re-arrest and violent re-arrest differed as a function of gang involvement. For this analysis, the curve for each group (gang-involved vs. non-gang) represents the proportion of that group the survived (e.g., was not re-arrested) for the specific time frame. In this case, re-arrest is measured in days at 182.5 days (6 months) and 365 days (12 months) post initial arrest. Log-rank tests for equality of survival functions indicate whether the functions significantly differed by gang involvement, or whether there is a greater proportion of youth who are avoiding re-arrest (i.e., surviving) in one group compared to the other. The covariates included in the Cox linear regression are age, sex, race, prior arrest, and initial school-based arrest.

The first set of analyses measured the survival function for each group at 6 months post initial arrest. These analyses indicate that there were significant differences in the survival function to general re-arrest, $X^2[1] = 31.18$, $p<0.01$, and violent re-arrest specifically, $X^2[1] = 4.11$, $p=.0427$, by gang involvement. Cox regression with covariates further indicated that the hazards ratio for gang involvement (HR: 2.49, $p<0.01$) was significant for general re-arrest and not significant for violent arrest (HR: 1.34, p=.654). Gang-involved youth had a 149% greater risk of general re-arrest at any time in the six-

month follow-up compared to non-gang youth. Figure 3.3 displays plots of the survival functions for general and violent arrests at 6 months post initial arrest.

The second set of analyses measured the survival function for each group at 12 months post initial arrest. These analyses indicate that there were significant differences in the survival function to general re-arrest, $X^2[1] =44.59$, $p<0.01$, and violent re-arrest specifically, $X^2[1] =5.46$, $p=.0195$, by gang involvement. Cox regression with covariates further indicated that the hazards ratio for gang involvement (HR: 2.66 $p<0.01$) was significant for general re-arrest and not significant for violent arrest (HR: 1.47, p=.447). Gang-involved youth had a 166% greater risk of general re-arrest at any time in the 12-month follow-up compared to non-gang youth. In addition, for general re-arrest, initial school-based arrest decreased (or protected survival) the risk of re-arrest by 43% ($p=.044$). As age of youth in the sample increased, the risk of general re-arrest also decreased by 13% ($p=0.49$). Figure 3.3 displays plots of the survival functions for general and violent arrests measured 12 months after initial arrest.

Research question 2: Can tattoos serve as valid indicators of gang involvement?

In order to assess the validity of tattoos as a marker for gang involvement in this study sample, several chi-square tests were completed. The total sample size was reduced to 702, which includes youth who had available data on both gang and tattoo variables. I used a chi-square test to determine if there was a relationship between the gang and tattoo variables. The first chi-square tested for the association between having a tattoo and being involved in a gang. Tattoo possession significantly differed by level of gang involvement, $X^2=58.09$, p<0.01, $df=1$, $V = .31$, such that tattoos were more common among gang youth (81%) than among youth with no gang involvement (35%). Of the

youth without tattoos (N=369), only 4% were gang-involved (N=14). Thus, among a juvenile justice sample, not having a tattoo is probably indicative of not being in a gang. However, the false positive rate is higher; of the youth with tattoos (N=255), only 24% were gang-involved (N=61). Thus, if I predicted gang involvement using tattoo presence alone, only 24% of youth in this sample would be correctly classified. I further conducted a logistic regression to show that tattoo possession is still uniquely associated with gang involvement, while controlling for age, sex, race, prior arrest, and initial school arrest. The results of the logistic regression reveal that tattoo possession (OR: 7.077, $p<.001$), sex (more likely for males, OR: 0.063, p=.007), and race (more likely for black race, OR: 5.45, P=0.022) significantly predicted gang involvement.

Next, a chi-square tested for the association between having a visible tattoo and being involved in a gang. Among youth with known location of tattoos (N=322), the chi square tested whether having a visible tattoo is associated with gang involvement. Approximately 38% of gang youth had visible tattoos (N=30), compared to 31% of non-gang youth (N=67). The chi-square test determined that there is no significant relationship between the gang and tattoo visibility variables (p=0.259).

Research Question 3: Can tattoos serve as predictors of juvenile recidivism?

The last question in this study is whether tattoos can serve as predictors of juvenile recidivism. Survival analyses determined whether youth with tattoos were re-arrested sooner than youth without tattoos following initial arrest. I use both the dichotomous tattoo variable as well as the tattoo visibility variable to determine if either predicts re-arrest. I first conducted survival analysis to determine if the survival curve to general re-arrest and violent re-arrest differed as a function of tattoos presence in general.

Similar to the previous analysis, the curve for each group (tattoo vs. non-tattoo) represents the proportion of the group that survived (e.g., was not re-arrested) for the specific time frame. Again, re-arrest is measured in days at 182.5 days (6 months) and 365 days (12 months) post initial arrest. Tattoo presence was coded at 1 for youth with tattoos and 0 for youth without tattoos. Tattoo visibility was coded at 1 for youth with tattoos on the head, face, neck, wrists, and hands and 0 for not visible tattoos, those on other body parts (e.g., back, shoulders, legs). Log-rank tests for equality of survival functions indicate whether the functions significantly differed by tattoo presence in general first and then by tattoo visibility. The covariates included in the Cox linear regressions are gang involvement, age, sex, race, prior arrest, and initial school-based arrest.

First, I measured the survival function for general tattoo presence (tattoo vs. non-tattoo) at six months post initial arrest. These analyses indicated that there were significant differences in the survival function to general re-arrest, $X^2[1] = 23.09$, $p < 0.01$, by tattoo presence. The hazards ratio for tattoo presence (HR: 2.38, $p < 0.01$) was significant for general re-arrest, with all other covariates remaining not significant. Gang involvement no longer significantly predicted six month re-arrest once tattoo presence was included. Youth with tattoos had 138% greater risk of re-general re-arrest within six months compared to youth without tattoos. Violent re-arrest specifically at six months post initial arrest was not significant, $X^2[1] = 1.87$, $p = .172$. Figure 3.4 displays plots of the survival functions for general and violent arrests by tattoo presence at six months post initial arrest.

Next, I measured the survival function for general tattoo presence (tattoo vs. non-tattoo) at 12 months post initial arrest. These analyses indicated that there were significant differences in the survival functions to general re-arrest, $X^2[1] = 39.15$, $p<0.01$, but not for violent re-arrest, $X^2[1] = 2.68$, $p=0.102$, by tattoo presence. Cox regression with covariates further indicated that the hazards ratio for tattoo presence (HR: 2.62 $p<0.01$) and gang involvement (HR: 1.67, $p=.027$) were significant for general re-arrest. Youth with tattoos had 162% greater risk of general re-arrest within 12 months compared to youth without tattoos. Youth in gangs had a 67% greater risk of general re-arrest within 12 months compared to non-gang youth. As age of youth in the sample increased, the risk of general re-arrest decreased by 18% (HR: 0.82, $p=0.008$). Figure 3.4 displays plots of the survival functions for general and violent arrests by tattoo presence at 12 months post initial arrest.

In order to determine whether the visibility of tattoos predicted re-arrest, I conducted two more sets of survival analyses. These analyses were conducted with youth with non-missing tattoo location data (N=322). I measured the survival function of re-arrest for the groups based on tattoo visibility (tattoos on face/neck/hands vs. tattoos on other body parts) at six and 12 months post initial arrest. These analyses indicated that there were no significant differences in the survival functions to either general re-arrest, $X^2[1] = 3.02$, $p=0.082$, or violent re-arrest specifically, $X^2[1] = 1.44$, $p=0.231$, by tattoo visibility. Similarly, at 12 months post arrest, there were no significant differences in the survival functions to either general re-arrest, $X^2[1] = 0.88$, $p=0.348$, or violent re-arrest specifically, $X^2[1] = 0.18$, $p=0.675$, by tattoo visibility.

Dissertation Study 2: Case Study in Juvenile Diversion: COPY

This study will determine the odds of re-arrest for youth following referral to and engagement in a voluntary diversion program, *COPY (Call Out Program for Youth)*, aimed to reduce youth violence. The COPY program includes important elements of comprehensive and effective intervention programs associated with reducing crime outcomes such as an intervention team, community involvement, and expertise sharing among agencies (Hodgkinson et al., 2009). Intervention and diversion programs that incorporate these elements into their program design have shown had some positive outcomes in reducing problem behavior among adolescents, and specifically, among gang-involved youth. The first research question asks whether a referral to services for first time youth offenders decreases the likelihood of re-arrest in the future, regardless of whether youth engage in services. A previous study found that youth who were referred to an intervention program, but did not fully participate, had lower rates of re-arrest compared to youth who were assigned to alternate probation program (Quinn & Van Dyke, 2004). Thus, I would expect that youth who are referred to the COPY program will be less likely to recidivate than youth who did not receive any referrals. The second question asks whether first time youth offenders who engage in the program will have lower rates of re-arrest in the future. I would expect that youth who engaged in the program will have lower re-arrest rates compared to youth who did not engage. The final question is whether any intervention effects are moderated by gang involvement. Does either referral or engagement in a voluntary diversion program decrease recidivism for gang involved youth? I would also expect that gang-involved youth who were referred to

the program and engaged in services are less likely to be re-arrested in the future compared to gang youth not referred to services.

COPY: Call Out Program for Youth

The Call Out Program for Youth (COPY) is a program aimed to reduce the incidence of youth violence by connecting youth who show early signs of a pathway into violence to evidence-based intervention services. COPY is a partnership among the Newark Police Department (NPD), Rutgers Center for Youth Violence and Juvenile Justice, and the greater Newark service provider network. This program began in April 2015 and is currently active. The COPY program shares key features with other recognized intervention programs with similar aims. The Richmond (VA) Gang Reduction and Intervention Program (GRIP) used street outreach to connect gang-involved youth (ages 10-24) to alternative lifestyles and activities that aimed to reduce gang involvement and crime (Cahill et al., 2008). The COPY program also incorporates aspects from OJJDP's Comprehensive Gang Model, which concentrates on assessing the needs of youth and providing them with individualized support services by involving their families, local organizations, and communities (Cahill et al., 2008).

The COPY program includes three basic steps: 1) identifying target youth and determining eligibility for COPY; 2) reaching out to ("calling out") and assessing the needs of target youth, referring them to readily available services in or close to their neighborhoods; and 3) tracking those youth over time to evaluate the effectiveness of the program. COPY is unique in that this program is completely voluntary and there is no penalty to families for refusing to participate. COPY referrals happen as soon as possible

following arrest, many times before any court dispositions are made. Outcome of court disposition does not affect COPY eligibility.

COPY Procedure

Youth in early to middle adolescence (12-17 years of age) who have been arrested for the first time and arrested on an eligible offense are identified as eligible for referral to COPY. When the program began in April 2015, only youth arrested for the first time for robbery were eligible for a referral to the program. In 2016 the NPD's Youth Aid Division leadership decided to expand eligibility by increasing the number of offenses that could result in a COPY referral. The following offenses are eligible for a COPY referral: robbery, weapons possession, receiving stolen property, controlled dangerous substance (CDS) possession with intent to distribute, and simple assault on school personnel (case by case basis). The NPD Youth Aid Bureau identified these as the most common offenses for first-time serious juvenile arrests in Newark, NJ.

Within the first 48 hours of arrest, parents/guardians of all youth arrested for the first time for eligible COPY offenses are contacted by a youth aid officer in NPD. This initial contact by phone is a referral to the COPY program. It secures oral parent/guardian consent to refer the youth to services by the COPY team. The COPY team, which is comprised of youth aid officers, Rutgers staff, and community service agency representatives, meets regularly (1x/month) at the NPD to review new and existing cases. The team evaluates and assigns new cases to service agencies. The assigned service agency then further contacts the parent/guardian to conduct an in-person meeting known as an intake. Once youth complete this first intake visit, they are then engaged in services with the provider. Current cases are also reviewed at the COPY meetings to determine fit

and participation. If necessary, another agency can take on existing cases, or the NPD can contact the family to reassess participation. The following agencies are part of the service provider network and fully support COPY by providing violence prevention services to COPY candidates:

Big Brothers Big Sisters (BBBS). BBBS is a nationally recognized mentoring program for at-risk youth. The BBBS organization in Essex County offers a federally funded high-risk mentoring program that, in addition to regular 1:1 mentor matching, includes a variety of support services designed to promote educational and vocational development. BBBS mentoring has been recognized as a well-validated evidence-based strategy for promoting positive youth development (Tierney, Grossman, & Resch, 2000). For the COPY program, BBBS offers 1:1 mentoring services and educational/vocational support workshops.

Community Solutions, Inc. (CSI). CSI administers an intensive home-based program called Multisystemic Therapy (MST; Henggeler et al., 2009), in which masters-level clinical therapists with small caseloads (typically fewer than 5 active cases) provide and support a variety of interventions designed to promote better family interactions, improved parent monitoring of youth, and youth engagement in positive activities. MST has been recognized as a well-validated evidence-based strategy for reducing juvenile offending (Schoenwald, 2008). For the COPY program, therapists from CSI provide MST services to youth and their families.

Newark Community Solutions (NCS). NCS offers a variety of services for youth and families dealing with challenging issues including job readiness, decision

making, conflict resolution, and parenting. For COPY, this primarily involves workshops and support groups for youth and parents/caregivers managing those challenges.

Sample

Data were obtained from the Newark Police Department Youth Aid Bureau. In addition to all arrest information included in Study 1, this data also includes information on COPY program referral, participation (engagement), and outcomes. Youth eligible to participate in the COPY program must have been arrested in the city of Newark for the first time for any of the following offenses: robbery, weapons possession, receiving stolen property, and CDS possession with intent to distribute. Since the inception of the program, all youth who met eligibility criteria were referred to the program. Youth could not have any prior arrests to be eligible for COPY.   The full sample from Dissertation Study 1 was reduced to 266 youth who met eligibility criteria for COPY. This reduced sample comprises 22% of the full sample of 1,008 youth. In order to implement a case control design, I created a control group that included youth who met COPY criteria before the COPY program was in effect, from January 2014- April 2015. These youth would have been referred to the program based on the current COPY criteria had it been in existence at the time. The control group yielded 143 youth (54%). Total youth referred to the COPY program comprise 46% of the reduced sample (N=123), of which 14% engaged (N=17). Youth who were only referred to COPY but did not engage consisted of approximately 40% of the reduced sample (N=106). Out of the total reduced sample, 35 youth were involved in gangs (13%). Descriptive statistics of all variables are included in Table 4.1.

Measures

Arrest/Recidivism. The date and offense type (i.e., property, violent crime, drug offense, weapon) were recorded by police officers for all arrests during the recidivism check period. With regards to recidivism, information was received on each arrest event occurring between January 2014 and December 2017. This information was gathered using the Newark Police Department Youth Aid Bureau data management system and entered into a database for analysis.

COPY youth. COPY youth include youth who were arrested in Newark for the first time for any of the following offenses: robbery, weapons possession, receiving stolen property, and CDS possession with intent to distribute. Youth who met these criteria and were contacted by the NPD and social service agencies, but did not enroll in the program, were labeled as REFERRED (1). Control (0) includes those youth who were arrested for the first time in Newark for COPY offenses before the program was implemented, from January 2014 to April 2015. The referral group was further separated for comparison, to include eligible youth and their caregivers who agreed to services and actively engaged in the COPY program, labeled as ENGAGED, and youth who were referred to the program but did not participate or engage, labeled as REFERRED ONLY. Because the COPY program is intended for youth who have only had a first time arrest, any youth who have had any arrests prior to the study period were not included in this sample.

Gang involvement. Information regarding youth gang affiliation was obtained via self-report and official police record during arrest. During arrest and processing, youth who self-reported as gang-involved were identified as gang affiliated. Using the arrest data, I classified each arrest as a dichotomous (yes/no) measure indicating whether

youth had any gang affiliation. Youth who indicated gang affiliation at first arrest were classified as gang affiliated.

Demographics. This measure includes demographic information obtained at arrest (i.e., age, sex, and race). Race is dichotomized as non-black (0) and black (1). Black includes African American (86%). Non-black race includes Hispanic, (12%), white (1%), and other (<1%). Sex is dichotomized as male (0) and female (1).

Analytic approach

Utilizing an intent-to-treat approach, this study will first measure re-arrest outcomes of all youth referred to the COPY program compared to control youth. Further logistic regression analyses and survival analyses will predict re-arrest after first time arrest among the three groups: control, referred only, and engaged. I will also examine whether any significant intervention effects are moderated by gang involvement. Lastly, using logistic regression, this study will determine whether referral to the COPY program decreases future re-arrest specifically for gang-involved youth.

Results

Research question 1: Does referral to services have an impact on re-arrest outcomes?

I used a chi-square test with an alpha of 0.05 to determine if there was a relationship between the predictor variables and the COPY groups. An alpha of .017 was used for post-hoc comparisons in order to adjust for an inflated familywise error rate. The predictor variables tested included age, race, sex, and gang involvement. A chi-square analysis indicated that gang involvement significantly differed by levels of COPY program involvement, $\chi^2 (2) = 14.47$, $p < .001$, $V = .31$. Youth in the control group (46%)

were significantly more likely to be involved in gangs than youth in the referred group (16%). Thus, only gang involvement was used as a control variable in all further logistic regression analyses. All other predictor variables did not differ significantly between the control and referred groups. Prior arrests were not used as a predictor variable because all youth in the sample had no prior arrests. School arrests were not consistently recorded by police until 2015; thus, due to missing data on the school arrest variable for the control group, initial school arrest was not used as a control variable.

Logistic regression analyses determine the odds of re-arrest for all youth who were referred to COPY (N=123) compared to the control group (N=143). Youth in the control group would have received a referral to the COPY program if the program existed during the first 16 months of the study period. In order to account for the time youth typically engage in service provision (approximately 2-5 months), logistic regression models predicted re-arrest at the following time periods: 3 months, 5 months, and 7 months. The model predicting re-arrest at 3 months post initial arrest found that compared to the control group, referral to services alone (OR: 0.273, $p=.030$) had significant effects on the odds of re-arrest. Compared to the control group, which received no formal referral to services through the COPY program, youth in the referred group had a decrease in odds of re-arrest within three months by 72.7%. Although seven gang youth were re-arrested within 3 months (5 control, 2 referred), gang involvement was not significant (OR: 2.49, $p=.129$). In order to account for the full 3 month re-arrest period, youth with a first time arrest between October 2017 to the end of the study period, December 2017, were excluded from analyses (n=5). Figure 4.1 displays the predicted probability of re-arrest within 3 months between the two groups.

The logistic regression model predicting re-arrest at 5 and 7 months post initial arrest found that referral to services (OR: 0.791, p=.667; OR: .465, p=.132, respectively) did not have any significant effect on the odds of re-arrest compared to the control group at any time point. Gang involvement was also not significant at five months (OR: 2.01, p=.182) or seven months (OR: 2.00, p=.197). By seven months, 10 gang involved youth were re-arrested (36%). In order to account for the 5 and 7 month re-arrest period, 14 arrests and 30 arrests, respectively, were excluded from the analyses. Re-arrest analyses were stopped at 7 months, due to the number of arrests that needed to be excluded to account for time. Beyond 7 months, the referral group was too small to make accurate predictions. Table 4.2 displays odds ratios from the logistic regression models predicting re-arrest.

Research question 2: Does engagement in services have an impact on re-arrest outcomes?

In order to further examine whether engagement in services had an impact on re-arrest outcomes, the referred group (N=123) was broken down into two groups: youth who enrolled in services and participated in the program (engaged, N=17) and youth who were only referred, but did not enroll in services (referred only, N=106). I next implemented a logistic regression in order to determine the magnitude of association between the three COPY groups (control, referred only, and engaged) and recidivism outcomes. The logistic regression model predicting re-arrest at 3 months post initial arrest found that compared to the control group, referral to services (OR: 0.306, p=.042) had significant effect on the odds of re-arrest. Compared to the control group, youth who were only referred to services but did not enroll in the program, had a decrease in odds of

re-arrest within three months by 69.4%. The engaged group did not have any arrests at the three month time point.

The logistic regression model predicting re-arrest at 5 months post initial arrest found that compared to the control group, neither referral to services (OR: 0.873, p=.791) nor engagement in services (OR: 0.299, p=.291) had any significant effect on the odds of re-arrest. The logistic regression model predicting re-arrest at 7 months post initial arrest found similar results. Neither referral to services (OR: 0.522, p=.182) nor engagement in services (OR: 0.162, p=.105) significantly decreased the odds of re-arrest. Gang involvement was also not significant at five months (OR: 2.00, p=.167) and seven months (OR: 1.88, p=.216). Figures 4.2 and 4.3 display the predicted probabilities of re-arrest within five and seven months. Table 4.2 displays odds ratios from the logistic regression models predicting re-arrest.

In order to further demonstrate differences in re-arrest by the three groups over time, I conducted a survival analysis. The survival analysis determined if the survival curve to re-arrest differed among the three groups: control, referred, and engaged. Similar to the analyses in study 1, the curve for each group represents the proportion of the group that survived (e.g., were not re-arrested) for the specific time frame. Re-arrest is measured in days at 91 days (3 months) and at 212.9 days (7 months) post initial arrest. Log-rank tests for equality of survival functions indicate whether the functions significantly differed by the three groups. The covariates included in the Cox linear regressions are gang involvement, age, sex, and race.

The analyses indicated that at 3 months there were significant differences in the survival function to re-arrest, $X^2[1] = 2.76$, $p=.097$, between the referred and control

groups. The hazards ratio for the referred group (HR: 0.292, p=.032) was significant for re-arrest, with all other covariates remaining not significant. Youth who were referred to the COPY program had 71% lower risk of re-arrest within 3 months compared to youth in the control group. By 7 months post arrest, there were no significant differences in the survival functions to re-arrest, $X^2[2] = 1.55$, p=0.461, among the three groups. Gang involvement did not significantly predict re-arrest at any time. Figure 4.4 displays plots of the survival functions up to 7 months (212.9 days) for re-arrest by COPY groups.

Research question 3: Does referral to services decrease re-arrest for gang involved youth?

To further test whether referral to COPY had an impact on recidivism for gang involved youth, I added a gang by referral interaction term to the original logistic regression that determined the odds of re-arrest for all youth who were referred to COPY compared to the control group. Out of the sample of 266 youth, only 35 youth were gang involved (control N=16; referred N=19). This gang sample was 94% male and 95% nonwhite. Table 4.1 displays descriptive statistics of re-arrest for this gang sample. After adding the interaction term, the 3 month intervention effect was not significant for gang (OR: 0.897, p=.934) or non-gang (OR: 0.378, p=.292) youth. The results determine that referral to COPY did not have an impact of recidivism for gang involved youth. Table 4.2 displays odds ratios from the original logistic regression model predicting re-arrest.

CHAPTER 5

DISCUSSION AND CONCLUSIONS   The aims of this dissertation were twofold. First, it examined the influences of gang involvement and the presence of tattoos on recidivism and secondly, it investigated the impact of a voluntary diversion program on recidivism outcomes for high risk youth.

Summary

In Dissertation Study 1, I first examined the extent to which gang involvement influences re-arrest in general and violent (i.e., crime against a person) re-arrest. Interestingly, the results showed that general re-arrest rates significantly differed between gang-involved and non-gang youth, but violent re-arrest rates did not. I expected similar outcomes for both general and violent re-arrests in terms of gang involvement; however, gang involvement in this sample did not significantly influence violent re-arrest rates. The findings from the survival analysis show that gang youth were also re-arrested sooner than were non-gang youth following initial arrest. These findings were observed while controlling for key covariates, such as age, race, and sex. My hypothesis that gang youth are re-arrested sooner and at higher rates than non-gang youth was thus supported for general arrests, but not for violent re-arrests. This might be due to the low rate (12%) of gang youth involved in violent re-arrests.

In the second part of Dissertation Study 1, I analyzed data on 702 youth to determine if tattoos can serve as valid indicators of gang involvement among a juvenile justice sample. Since tattoos have been used as criteria to indicate gang membership in schools, prisons, and by law enforcement (Chandler et al., 1998; Fong & Buentello, 1991), I expected that they would also serve as indicators of gang involvement on youth

in this study. Tattoos in general were more common among gang-involved youth versus non-gang youth. The results suggest that tattoo presence alone was not a sufficient predictor of gang involvement. However, after including control variables, tattoo presence remained strongly and uniquely associated with gang involvement. The findings showed that tattoo visibility was not determined to be equally indicative of gang involvement. This null finding might be due to the reduced sample for which tattoo visibility was known (32% of the total sample). Unlike previous studies which suggested tattoos on the face, head, neck or hands suggest a stronger commitment to criminal gang life (Etter, 1999; Phelan & Hunt, 1998); this study did not yield similar results.

Using survival analysis, this study also measured whether tattoos can serve as valid predictors of juvenile recidivism. My hypothesis that tattooed youth are re-arrested sooner and at higher rates than non-tattooed youth was supported for general arrests, but not for violent re-arrests. These findings were observed even after controlling for gang involvement. My second hypothesis on tattoo visibility was not supported. Tattoos which are more likely to be associated with gang involvement (located on the head, neck, face, and hands) did not have an effect on any re-arrest rates at either time point. Again, this may be due to the reduced sample.

In Dissertation Study 2, I used logistic regression analysis to predict whether COPY program referral and engagement had significant impacts on arrest outcomes 3, 5, and 7 months after initial arrest. The first research question asked whether a referral to services after a first time arrest decreased the likelihood of re-arrest. The results determined that youth who were referred to services were less likely to be re-arrested within three months compared to youth in the control group. Referral to services did not

have a significant impact on arrest after three months. The results suggest that referral to services provides a short term effect on recidivism. A referral to the COPY program includes one contact by law enforcement (in person or by phone), sometimes followed by contact from COPY services agencies. All families who are referred to services receive at least one contact with law enforcement offering voluntary services.

The second research question in Dissertation Study 2 asked whether engagement in services after a first time arrest decreases the likelihood of re-arrest. All youth who met the COPY criteria (123 youth) were referred to the program; however, very few actively participated in services (17 youth or 14%). None of the youth who engaged in services were re-arrested during the first three months after initial arrest. The findings from the dissertation study suggest that the 14% engagement level for the COPY program is lower than other programs for first time youth offenders in the juvenile justice population. A similar study, which evaluated a court mandated multiple-family group-intervention (MFGI) program for first-time juvenile offenders, had a 74% engagement rate (Quinn & Van Dyke, 2004). However, the major difference in the two programs is that engagement in the COPY program was completely voluntary, whereas youth were referred by the court system to participate in MFGI. The COPY program is unique in that it is offered to youth and their families pre-adjudication and is completely voluntary, which may explain the low engagement levels.

The last research question in Dissertation Study 2 asked whether referral or engagement in services decreases recidivism among gang youth in particular. No gang involved youth engaged in services and very few gang youth were referred to services. Since no gang youth engaged in services during the study period, the question remained

whether referral only to a voluntary diversion program had any impact on re-arrest in the future. Due to the small sample of gang involved youth (13%) and the loss of power, the results from the logistic regressions predicting re-arrest at any time point post arrest for gang youth who were referred to COPY services were not significant. Thus, the results suggest that referral to services did not have a significant impact on recidivism for gang involved youth.

Limitations

It is important to note that gang involvement was not completely determined by tattoos in the current sample. This is a limitation of the current sample, as tattoo possession and gang involvement are much more likely to be correlated in this sample, where in addition to self-report, law enforcement officers are likely using tattoos as a measure of gang involvement. In terms of differentiating tattoos by gang symbols, there was not enough data available, and thus, only tattoo visibility was used as an indicator of gang involvement.

Another limitation in this study is that selection played a key role in determining the youth in the engagement group. Due to individual factors -- for example, greater level of parental involvement and/or a predisposition to seek help -- youth in the engagement group were different from the onset compared to youth in the referral group. Thus, it is not surprising that youth in the engagement group were less likely to be re-arrested. Engaging in the program could have only helped youth and their families who were already seeking some type of intervention post-arrest. Only two youth who engaged in the voluntary program were re-arrested during the entire study period. Engagement in the

program did not have a negative impact on these youth; however, the lower re-arrest rates cannot be attributed to engagement in services alone.

The short term findings emphasize an important limitation in this study which is the additional loss of power in later months, due to smaller sample sizes. Even though the odds of re-arrest decreased by more than half for the referral group, this was not significant because the error was so much larger for the smaller sample size. Thus, the results show that the immediate effect of a decrease in recidivism after a referral to services does not remain over the long term. Future studies should track referrals to services over a longer period of time in order to gain a larger gang sample and more robust conclusions to determine any long term effects. Although the engagement sample is small, engaging in the program may have contributed to a positive outcome in terms of re-arrest on the youth. Further research would need to investigate other positive outcomes related to engagement in the COPY program such as the impact on mental health factors, self-esteem, parental involvement, engagement in prosocial activities, etc.

Another critical limitation in this study was the low rate of youth who engaged in the program following referral. One of the key elements of the COPY program is that services offered to youth and their families are completely voluntary. In addition, because youth are underage, parental consent was required in order to be included in any type of service allocation. Encouraging justice-involved youth and their families to participate in the program was one of the challenges faced by the COPY team. The main incentive to participate in the COPY program was the potential to help youth engage in positive activities and reduce the likelihood of future arrest. Many families initially agreed to participate in services, but when further contact was made, families would ultimately

decline. This may have been due to attitudinal barriers met by some families who disagreed with the perception that their child was at risk and/or needed help (Mendez et al. 2009). In some cases, families acknowledged that their children's initial arrest and other problem behaviors may have put them at a greater risk, yet they still declined services. Future studies could examine whether mandated or incentivized participation for the COPY program would have a greater impact on re-arrest and behavioral outcomes. This would include implementing an experimental/quasi experimental design.

It is also important to note that these findings are limited by data censoring accruing from intervening events. The starting time point in the two dissertation studies is an initial arrest, yet a variety of events cascading from that initial arrest event could have reduced or increased the likelihood of future re-arrests in ways unrelated to my fixed predictors and wholly dependent on whether and how the youth were processed for the initial arrest by justice system.

Implications for theory and research

Most importantly, since there are no national estimates of arrest or recidivism rates for gang-involved juveniles, this is the first study to examine the role of gang involvement in juvenile recidivism. It is also the first study to examine the relationship between tattoos and recidivism on a U.S. sample of juvenile offenders. As evident in the study results, both gang involvement and tattoo presence influenced youth recidivism. These results align with Gottfredson & Hirschi's (1990) self-control theory, suggesting that youth in gangs and youth with tattoos have low self-control and a greater propensity to be impulsive, risk-seeking, and more likely to recidivate. The results also fall in line with Thornberry et al.'s (1994) selection model, which similar to self-control, argues that

associations with gang peers are a result of youth's own propensity to engage in delinquency (Thornberry et al., 1994). These theories provide a consistent explanation to the linkages between gang involvement, tattoo presence, and recidivism. The results of this study were not able to support the hypothesis that tattoos more likely to be associated with gang involvement (located on the head, neck, face, and hands) influenced recidivism. Visible tattoos on the face, head, neck or hands not only suggest a stronger commitment to criminal gang life (Etter, 1999; Phelan & Hunt, 1998), but they are also visible to anyone who comes in contact with the tattooed individual. Youth with such tattoos may be more likely to be labeled by law enforcement as criminal and/or gang involved, possibly influencing their likelihood of arrest and re-arrest. Future research would need to investigate whether the type of tattoos (gang vs. non-gang) and/or the location of tattoos are relevant to recidivism and other outcomes, such as desistance from gangs or persistence in offending behavior.

Dissertation Study 2 suggests that a referral to services might be a signal to youth that law enforcement cares about them and their future outcomes. Alternatively, youth may be impacted by the referral and steer away from crime because they may feel they are under more careful supervision by law enforcement. Deterrence theory would suggest that youth who receive a referral from law enforcement might believe that they have a higher likelihood of being caught and punished for another crime. This theory would also explain why the results are significant in the short term, but not in the long term. The referral to services no longer provides a deterrent effect once enough time has passed (at least three months) and youth no longer believe they are under more strict observation by law enforcement.

Gottfredson and Hirschi's (1990) self-control theory is often used to explain the connections between maltreatment experiences during childhood and negative youth outcomes in adolescence. However, in the case of this study, it may also be used to explain the challenges faced by the COPY team to engage youth and their families in services. Gottfredson and Hirschi (1990) would argue that youth and their families did not engage in services due to the parents' low attachment to their children, which may include neglect and other forms of maltreatment. Although, maltreatment experiences of the youth in the dissertation studies were unknown, it is possible that their outcomes were related to low self-control and ineffective parenting. Other explanations for the challenges to engage youth in service must also be considered. Barriers to engaging justice-involved youth in services are common and could have resulted from a combination of both structural and attitudinal factors, although this may vary from family to family (Mendez et al. 2009). Structural barriers include a lack of social and economic supports necessary to meet the unique needs of youth in order to fully engage in services (Arya, 2013). Cultural differences and language barriers may have also contributed to lower rates of engagement for some families (Mendez et al. 2009).

After controlling for youth's prior arrest in Dissertation Study 1, being older at the time of initial arrest was also associated with a decrease in odds of re-arrest after one year. In this case, youth have been aging out – moving away from delinquency towards young adulthood (Massoglia & Uggen, 2010; Sampson & Laub, 1993). Another explanation for this might be that adolescence in general is associated with an increased vulnerability to engage in risky behavior (Steinberg, 2004; 2007); thus youth arrested at an earlier age would have more time during the period of adolescence to engage in

delinquency, resulting in more possible re-arrests. Having an initial school-based arrest also decreased the odds of re-arrest at both time points. This outcome was surprising as classic labeling theory would suggest the opposite. It is possible that the consequences of school-based arrests have a deterrent effect. The results align more with deterrence theory, suggesting that youth may be deterred from future offending and increase their conforming behavior, leading to increased school involvement and reduced delinquency (Nagin, 1978, 1998). For youth who have been arrested in schools, the consequences of these arrests could have negative repercussions for youths' educational outcomes. In general, more research is needed in evaluating the impact of school-based arrests (Theriot, 2009), specifically if they involve any school disciplinary actions.

Implications for policy and practice

The first priority of evidence-based practices should be the reporting and collecting of quality data that accurately reflect youth behavior. Inaccurate data may result in biased findings which can misinform service providers and policymakers. In my dissertation studies, the analyses and results were influenced by arrest data provided by law enforcement. This data included several missing items on certain variables (e.g. disposition, tattoo symbols, initial school arrest) making it difficult to address specific questions from the proposal. As with any type of evidence-based initiatives, the ability to generalize to other juvenile high risk populations is critical. Only with accurate data can research inform policymakers about findings which can be generalized to the larger juvenile offending population.

Although tattoos were more common among gang youth than non-gang youth, they did not predict gang involvement. This finding has important policy implications

regarding how the justice system labels and identifies youth. Researchers suggest that self-nomination is an appropriate, robust measure of gang affiliation status (Esbensen, Winfree, He, & Taylor, 2001), yet tattoos have been used to identify youth as gang involved in prisons, schools, and by law enforcement. Although tattoo presence is associated with gang involvement, tattoos cannot be the only determinate in identifying youth as gang involved. Thus, the results of this dissertation suggest that law enforcement should use self-report in combination with other factors in determining gang involvement status of young offenders. Affixing an incorrect gang label on youth may add additional negative consequences to youth who may already find themselves in the criminal justice system.

As evident in the dissertation study, gang involvement influenced youth recidivism. The preliminary studies also showed that gang-involved youth had higher levels of problem behavior, victimization, weapon carrying, externalizing factors, and peer fighting compared to their non-gang counterparts. Since there are many contributing factors to gang involvement, initial support to reduce delinquency among gang involved and other high risk youth must begin at the community level. Hipp et al. (2010) found that simply being in close proximity to social services decreased the likelihood of recidivating. This knowledge can be used by policy makers to locate social service agencies which could potentially benefit high risk youth in the community. For example, for youth who engaged in MST services, therapists met directly with the youth and their caregiver in the youth's homes to conduct services. The services provided by the COPY program were all in close proximity to youth residences and easily accessible for youth and their families. Next, intervention programs, such as COPY, which combine social

services and law enforcement, are crucial in addressing delinquency problems at the community level. Since the COPY team faced several challenges to providing and engaging services to youth, service providers and law enforcement need to have a clear understanding of the barriers involved in working with high risk youth and their families. Combining law enforcement and social service providers allowed the two agencies to be on the "same team" in terms of youth outcomes. Before the COPY program was implemented, social service agencies and law enforcement were essentially addressing the same high risk population of youth, yet, not in the most direct or coherent ways. Streamlining and combining these agencies allowed for immediate intervention to take place during the first few days following arrest.

The first preliminary study showed that gang youth in particular, who were victimized in schools, had an increased risk of serious problem behavior and alcohol use. Given the victim-offender overlap, this result was not surprising. Previous studies have also shown that school disciplinary actions, in the form of suspensions or expulsions, place youth at risk for involvement in the juvenile justice system (Costenbader & Markson, 1998; Monahan, VanDerhei, Bechtold, & Cauffman, 2014). The dissertation study found that youth who had an initial school-based arrest were less likely to be re-arrested a second time. There is a possibility that for youth in this study who were arrested while in school, some schools may have implemented in-school suspension consequences. Being within the confines of the school building could have reduced the likelihood of police contact and possible re-arrest. Nonetheless, the specificity of the data was limited in that I did not know if and how youth were punished by school administration for an initial school based arrest. For school administrators and policy

makers, understanding the impact that a first time arrest may have on youth is critical in forming reasonable and fair school disciplinary policies. It is important for school administrators to understand that strict discipline policies can increase the risk of future involvement in the justice system, especially for youth who have already been arrested. Thus, school policies should consider in-school suspensions, where youth will spend more time in the presence of capable guardians (Cohen & Felson, 1979), ultimately reducing their likelihood of police contact and victimization in the community.

These findings support ongoing efforts at the levels of both policy and practice to reduce youth delinquency in general, as well as to enhance access to services for high risk youth. In the absence of statistically significant effects accruing in part from small cell sizes for the COPY intervention study, the program has several benefits of practical importance. First, youth who engaged in COPY were not re-arrested at any time during the study period. In general, there is an immense economic impact on the community when considering the high cost of detention and re-entry services. The Justice Policy Institute (2014) estimates that the cost to incarcerate youth in the juvenile justice system is on average, $148,767 per person, per year. Compared to the other youth in the study, those who engaged in COPY were also provided with a greater opportunity to improve their overall well-being, engage in prosocial activities, and possibly attain an education and/or employment in the future. Thus, engagement in COPY has the potential to reduce the economic cost on the community, while also providing a personal benefit to youths' own well-being. Siblings of youth who engaged in the MST services through the COPY program also had the potential to produce positive outcomes and reduce their own delinquency (Dopp, Borduin, Wagner, & Sawyer, 2014). MST has shown to deliver

positive results that last 25 years post treatment (Dopp et al., 2014). Although it was not possible to measure the entire scope of the impact provided by the COPY program in this study, it is vital to note that the potential benefits are vast and can last for a long time.

There are many evidence-based approaches aimed at helping high-risk youth who are engaged in problem behavior (Boxer & Goldstein, 2012; Henggeler & Schoenwald, 2011; Hoge, Guerra, & Boxer, 2008), and there are also several gang intervention programs which support deterrence-based desistance from gangs while also addressing behavior outcomes of gang-related youth (e.g., Operation Ceasefire). Previous studies have shown that negative peer involvement, specifically gang involvement, is significantly related to unsuccessful treatment outcomes of youth engaged in community-based services (Boxer, 2011; Boxer et al., 2015). Thus, we must continue to provide and evaluate intervention programs that will reduce problem behavior among gang-involved youth. In order to improve efforts in the treatment of gang involved youth, it will be necessary to focus interventions specifically on individual youth and risk factors, such as tattoos, which may be associated with their gang involvement and carefully address barriers to the engagement of necessary support services.

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TABLES AND FIGURES

Table 1.1. Descriptive data for all preliminary study 1 variables

Table 1.1	Descriptive data for study variables											
	Overall				Non- Gang				Gang			
Variables	M	SD	Range	N	M	SD	Range	N	M	SD	Range	N
Demographics												
1 Age	15.07	1.34	11-18	421	15.04	1.33	11-18	327	15.18	1.40	12-17	94
2 Sex	.69	.46	0-1	421	.65	.48	0-1	327	.81	.40	0-1	94
3 Non-white ethnicity	.66	.47	0-1	421	.60	.49	0-1	327	.85	.36	0-1	94
Risk factors												
1 YSR-internalizing	11.31	9.27	0-43	385	11.19	9.08	0-41	295	11.72	9.91	0-43	90
2 Minor problem behavior	.88	1.08	0-5	393	.70	.87	0-4.7	302	1.47	1.43	0-5	91
3 Serious problem behavior	.16	.57	0-5	393	.06	.29	0-3.2	301	.51	.98	0-5	92
4 Marijuana use	9.11	10.63	0-42	388	8.58	10.62	0-42	296	10.83	10.54	0-36	92
5 Tobacco use	9.43	9.94	0-34	388	8.97	9.97	0-34	295	10.88	9.76	0-34	93
6 Alcohol use	5.04	7.20	0-37	388	4.67	6.80	0-35	296	6.24	8.29	0-37	92
School victimization												
1 purposefully hit by someone	.24	.43	0-1	381	.20	.40	0-1	291	.38	.49	0-1	90
2 weapon or force to get things	.04	.19	0-1	386	.03	.16	0-1	295	.08	.27	0-1	91
3 attacked with weapon	.06	.24	0-1	388	.04	.20	0-1	297	.13	.34	0-1	91
Street victimization												
1 purposefully hit by someone	.26	.44	0-1	387	.19	.39	0-1	297	.48	.50	0-1	90
2 weapon or force to get things	.05	.21	0-1	389	.03	.16	0-1	299	.11	.32	0-1	90
3 attacked with weapon	.09	.28	0-1	388	.05	.21	0-1	298	.22	.42	0-1	90
Total victimization												
1 school only	.13	.34	0-1	390	.11	.31	0-1	299	.20	.40	0-1	91
2 street only	.13	.33	0-1	389	.13	.33	0-1	298	.12	.33	0-1	91
3 total victimization	.40	.49	0-1	381	.34	.47	0-1	291	.62	.49	0-1	90

Table 1.2. Correlations for all preliminary study 1 variables

Table 1.2 *Correlations for all study variables*

Variables	1	2	3	4	5	6	7	8	9	10	11	12
Demographics												
1 Gang	--											
2 Age	.04	--										
3 Gender	.14**	.03	--									
4 Non-white ethnicity	.22**	-.08	.05	--								
Risk factors												
5 YSR internalizing	.02	.01	-	-.12*	--							
	.30**	.21**	.4**	-.09	.16**	--						
6 Minor problem behavior	.33**	.10	.04	.01	.01	.59**	--					
	.09	.22**	.12	-.08	.07	.40**	.26**	--				
	.08	.32**	-	-	.18**	.44**	.25**	.52**	--			
7 Serious problem behavior	.09	.14**	.01*	.03**	.13*	.37**	.21**	.50**	.48**	--		
			-.03	-								
			-.02	.14**								
8 Marijuana use												
9 Tobacco use												
10 Alcohol use												
Victimization variables												
11 school only	.19**	-.02	-.06	-.02	.09	.24**	.18**	.07	.11*	.06	--	
12 street only	.28**	.06	.05	.01	.1	.35**	.28**	.1*	.19**	.21**	.34**	--
13 total victimization	.25**	-.01	-.01	-.02	.13*	.33**	.25**	.09	.17**	.14**	.74**	.75**

Note: p<.05*, p<.01**

Table 1.3. Linear and Tobit regression analyses predicting victimization

Predictors	Total Victimization *β* (SE)	Street Victimization *β* (SE)	School Victimization *β* (SE)
Linear regression			
Gang involvement ɪ	.22 (.12)***	.23 (.132)***	.17 (.14)***
Age	-.01 (.04)	.05 (.038)	-.05 (.04)
Male ɪ	-.02 (.11)	.01 (.122)	-.04 (.12)
Non-white ethnicity ɪ	-.06 (.1)	-.07(.114)	-.04 (.12)
Tobit regression			
Gang involvement ɪ	.50 (.38)***	.51 (.31)***	.40 (.33)**
Age	-.03(.1)	.11 (.07)	-.08 (.08)
Male ɪ	.04 (.31)	-.02 (.25)	-.15 (.25)
Non-white ethnicity ɪ	-.43 (.31)	-.36 (.24)	-.27 (.25)

Note. ɪ Reference groups are non-gang involvement, female, two parent household and white ethnicity.
p<.05*, p<.01**, p≤.001***

Table 1.4. Regression analyses predicting internalizing symptoms, minor problem behavior, and serious problem behavior

Step Predictors	Internalizing Symptoms			Minor Problem Behavior			Serious Problem Behavior		
	Step 1 β	Step 2 β	Step 3 β	Step 1 β	Step 2 β	Step 3 β	Step 1 β	Step 2 β	Step 3 β
Step 1									
Age	-.00	-.00	-.01	.21***	.16***	.17***	.10	.05	.06
Male	-.39***	-.42***	-.41***	.04	-.01	-.00	.12*	.08	.09*
Non-white ethnicity	-.10*	-.11*	-.11*	-.08	-.14**	-.14**	.01	-.05	-.05
R^2	.18***			.05***			.02		
Step 2									
Gang involvement		.08	.10		.22***	.22***		.25***	.23**
School victimization		.06	.04		.09	.05		.15**	-.04
Street victimization		.02	.11		.27***	.25**		.28***	.05
R^2 change for step	.01			.19***			.26***		
Step 3									
Gang involvement by school victimization			.03			.07			.31***
Gang involvement by street victimization			-.12			.00			.20*
R^2 change for step	.00			.00			.09***		

p<.05*, p<.01**, p≤.001***

Table 1.5. Regression analyses predicting alcohol use, tobacco use, and marijuana use

Step Predictors	Alcohol use			Tobacco use			Marijuana use		
	Step 1 β	Step 2 β	Step 3 β	Step 1 β	Step 2 β	Step 3 β	Step 1 β	Step 2 β	Step 3 β
Step 1									
Age	.12*	.11*	.11*	.29***	.27***	.27***	.21***	.19***	.20***
Male	-.01	-.02	-.01	-.01	-.02	-.02	-.00	-.02	-.01
Non-white ethnicity	-.12*	-.14**	-.14**	-.32***	-.35***	-.35***	-.06	-.07	-.07
R^2	.03**			.21***			.05***		
Step 2									
Gang involvement		.06	.05		.10*	.10*		.06	.05
School victimization		.10	-.00		.03	-.03		-.02	-.10
Street victimization		.15*	.10		.11	.10		.13	.07
R^2 change for step	.06***			.04***			.02*		
Step 3									
Gang involvement by school victimization			.21*			.11			.17
Gang involvement by street victimization			-.00			.02			.01
R^2 change for step	.02*			.00			.02*		

p<.05*, p<.01**, p≤.001***

Table 2.1. Descriptive statistics on maltreatment and gang variables

Table 2.1

Descriptive statistics on maltreatment and gang variables

	Non-Gang (n=439)			Transient Gang (n=139)			Stable Gang (n=33)		
Maltreatment Variables	*Percent of youth*	*Mean (SD)*	*Min-Max*	*Percent of youth*	*Mean (SD)*	*Min-Max*	*Percent of youth*	*Mean (SD)*	*Min-Max*
Any	67%	1.83	0-10	67%	1.58	0-10	79%	2.78	0-11
maltreatment	57%	(2.08)	0-7	53%	(1.82)	0-7	76%	(3.12)	0-8
Neglect	31%	1.17	0-4	35%	.94 (1.27)	0-5	42%	1.66	0-4
Physical abuse	16%	(1.47)	0-4	9%	.49 (.87)	0-4	6%	(1.84)	0-1
Sexual abuse	4%	.43(.76)	0-2	5%	.12 (.46)	0-2	6%	.72 (1.07)	0-2
Educational	30%	.20(.51)	0-6	23%	.06 (.26)	0-4	39%	.06 (.24)	0-6
neglect		.05(.27)			.36(.77)			.09(.38)	
Emotional abuse		.43(.78)						.73(1.26)	

Note: These column percentages indicate percent of youth in sample who experienced each maltreatment type. Means, standard deviations, minimum and maximum values are for the count of maltreatment events for each maltreatment type.

Table 2.2. Correlations for all preliminary study 2 variables

Table 2.2

Correlations for all study variables

Variables	1	2	3	4	5	6	7	8	9
Demographics									
1 Age	--								
2 Sex (1 = female)	.03	--							
3 Race (1 = non-white)	.03	.001	--						
Maltreatment									
4 Any maltreatment	.02	-.002	.01	--					
5 Neglect	.02	-.01	-.02	.77**	--				
6 Physical abuse	-.01	-.07*	.01	.45**	.39**	--			
7 Sexual abuse	.02	.14**	-.04	.27**	.23**	.26**	--		
8 Educational neglect	.07*	-.03	-.02	.15**	.19**	.14**	.11**	--	
9 Emotional abuse	.03	-.002	-.02	.43**	.43**	.46**	.26**	.20**	--

Note: p<.05*, p<.01**.

Table 2.3. Post hoc comparisons across gang involvement groups

Table 2.3

Weapon Carrying, Externalizing, and Peer Fighting Across Gang Involvement Groups

	Non- gang		Transient gang		Stable gang		F/χ^2	(df)
	N	$M/\%$ (SD)	N	$M/\%$ (SD)	N	$M/\%$ (SD)		
Weapon carrying								
Age 12	439	3.87%$_a$	106	8.49%$_a$	31	25.81%$_b$	26.65***	(2)
Age 16	439	10.93%$_a$	107	40.19%$_b$	29	51.72%$_b$	71.47***	(2)
Age 18	439	12.07%$_a$	109	38.53%$_b$	29	75.86%$_c$	96.18%	(2)
Externalizing								
Age 12	430	9.07$_a$ (6.64)	107	12.02$_b$ (7.85)	31	14.42$_b$ (7.73)	14.57***	(2, 565)
Age 18	387	8.22$_a$ (6.09)	87	13.45$_b$ (7.72)	23	15.00$_b$ (7.40)	32.11***	(2, 494)
Peer fighting								
Age 12	437	3.66%$_a$	109	16.51%$_b$	31	22.58%$_b$	46.75***	(4)
Age 16	438	6.16%$_a$	108	29.63%$_b$	30	46.67%$_b$	94.03***	(4)

Note. * $p = .050$, ** $p < .01$, *** $p < .001$. Percentages and chi-square results are presented for weapon carrying (carried any weapon) and peer fighting (most friends get into fights). Means, standard deviations, and ANOVA results are presented for externalizing. Different subscripts denote statistically significant differences among groups, according to $p < .001$ for Tukey's HSD (externalizing) or $p < .017$ for chi square analyses (weapon carrying and peer fighting), such that means/percentages with the same subscript are not significantly different from each other, and means/percentages with different subscripts are significantly different from each other, in increasing order.

Table 2.4. Multinomial Logistic Regression Models Predicting Experiences of

   Maltreatment and Neglect on Gang Involvement

Table 2.4

Multinomial Logistic Regression Models Predicting Experiences of Maltreatment and Neglect on Gang Involvement

Predictor	Reference=Stable Gang		Reference=Transient Gang		Reference=Non-gang		Wald $\chi^2(6)$
	Non-Gang	Transient Gang	Non-Gang	Stable Gang	Transient Gang	Stable Gang	
	RRR	*RRR*	*RRR*	*RRR*	*RRR*	*RRR*	
Maltreatment	.84*	.79**	1.05	1.25**	.95	1.19*	41.82***
Neglect	.82	.74**	1.11	1.34**	.90	1.21	38.48***
Physical abuse	.59	.74	.79	1.33	1.26	1.68	35.37***
Sexual abuse	.78	.38	1.49	.68	.67	.45	33.24***
Emotional abuse	.65	.47	1.38	2.12	.72	1.54	36.06***
Educational neglect	.71	.83	.85	1.21	1.17	1.41	33.53***

Note: RRR= relative risk ratio. * $p < .050$, ** $p < .01$, *** $p < .001$.

Table 3.1. Descriptive statistics overall and by gang involvement for dissertation study 1

Table 3.1

Descriptive statistics overall and by gang involvement

Descriptive Variables	Total Sample N (% of total sample)	Non-Gang n (% of non-gang)	Gang-Involved n (% of gang)	χ^2 (df)
Prior Arrest	234 (23%)	87 (15%)	47(37%)	34.33(1)***
Initial School-based Arrest	119 (12%)	111 (20%)	7 (10%)	3.86(1)*
Males	824 (82%)	476 (80%)	122 (96%)	18.32(1)***
Black	869 (86%)	508 (86%)	122 (96%)	10.13(1)***
Any tattoos	269 (27%)	193 (35%)	61 (81%)	58.09(1)***
Visible tattoos	56 (6%)	44 (26%)	9 (17%)	1.66(1)
General Re-arrest- 6 months	181 (18%)	89 (17%)	44 (48%)	42.09 (1) ***
Violent Re-arrest- 6 months	37 (4%)	21 (24%)	9 (20%)	0.17(1)
General Re-arrest- 12 months	239 (24%)	125 (23%)	60 (56%)	47.78(1)***
Violent Re-arrest- 12 months	55 (5%)	34 (27%)	14 (23%)	0.32(1)

Note. * $p = .050$, ** $p < .01$, *** $p < .001$. *Separate chi square analyses were run between gang involvement groups and each of the row variables. Total sample, N=1,008; Non-gang, n=592, Gang-involved, n=128.*

Table 3.2. Logistic regressions models predicting re-arrest

Table 3.2

Logistic Regression Models Predicting Re-Arrest

	Re-Arrest by 6 months		Re-Arrest by 12 months	
Predictor	General (N=543)	Violent (N=101)	General (N=580)	Violent (N=138)
	OR (CI)	*OR(CI)*	*OR(CI)*	*OR(CI)*
Gang	4.45(2.32-8.55)***	.50(.12-2.1)	4.66 (2.57-8.46)***	.56(.18-1.67)
Sex	.49(.24-.98)*	1.14(.27-4.82)	.46(.24-.87)*	1.7(.5-5.9)
Age	.85(.71-1.0)*	.94(.65-1.35)	.81(.7-.93)**	.91(.66-1.23)
Black race	1.13(.56-2.31)	.66(.16-2.66)	1.01(.54-1.88)	.97(.3-3.16)
Initial school arrest	.47(.24-.89)*	3.18(.82-12.4)	.41(.22-.74)**	1.6(.51-5.18)
Prior arrest	1.42(.74-2.73)	1.7(.53-5.3)	1.27(.75-2.37)	1.2(.44-3.08)

*Note: OR= odds ratio * p < .050, ** p < .01, *** p < .001. Robust standard errors were used.*

Table 4.1. Descriptive statistics of COPY groups and predictor variables

Table 4.1

Descriptive statistics of COPY groups and predictor variables

	Control (n=143)	*REFERRED (n=106)*	*ENGAGED (n=17)*	χ2 (df)
Predictor Variables	*N/%*	*N/%*	*N/%*	
Gang	16 (46%)	19(18%)	0 (0%)	25.11(2)***
Black race	115(80%)	95(89%)	16 (94%)	5.23(2)
Male sex	113(79%)	90(85%)	14(82%)	1.41(2)
Re-arrest in 2 months	11 (7%)	3 (3%)	0 (0%)	3.74(2)
Re-arrest in 3 months	18 (13%)	7 (7%)	0 (0%)	4.11(2)
Re-arrest in 4 months	20(14%)	10(10%)	0(0%)	3.25(2)
Re-arrest in 5 months	20 (14%)	16(17%)	1(6%)	1.64(2)
Re-arrest in 6 months	24(17%)	16(20%)	1(6%)	2.27(2)
Re-arrest in 7 months	25(18%)	14(18%)	1(6%)	1.62(2)
Any re-arrest	43(30%)	28(26%)	2(13%)	2.34(2)
Re-arrest 3 months by gang	5 (31%)	2 (11%)	0 (0%)	2.33(1)
Re-arrest 7 months by gang	7(44%)	3(25%)	0 (0%)	1.05(1)
Any re-arrest by gang	11(69%)	10(53%)	0 (0%)	0.94(1)

Table 4.2. Logistic regression models predicting re-arrest for COPY groups

Table 4.2

Logistic Regression Models Predicting Re-Arrest for COPY groups

Predictor	N	3 months OR (CI)	5 months OR(CI)	7 months OR(CI)
Total sample	266			
Referred group	123	.27(.08-.87)*	.81(.29-2.2)	.47(.17-1.2)
-Referred only	106	.31(.09-.95)*	.87(.32-2.4)	.52 (2.0-1.35)
-Engaged	17	--	.30(.03-2.8)	.16(.02-1.5)
Gang	35	2.11(.66-6.65)	2.0(.75-.5.4)	1.88 (.7-5.1)
Original Model with interaction				
Referred X gang	19	.26(.03-1.9)	--	--
Referred X no gang	104	1.49(.53-4.2)	--	--
Age	153	1.14(.74-1.77)	--	--
Race	153	1.34(.13-13.4)	--	--
Sex	153	1.88(.43-8.1)	--	--

*Note: OR= odds ratio * p < .050, ** p < .01, *** p < .001. Reference groups: control group, non-gang., male, non-black race. Robust standard errors were used.*
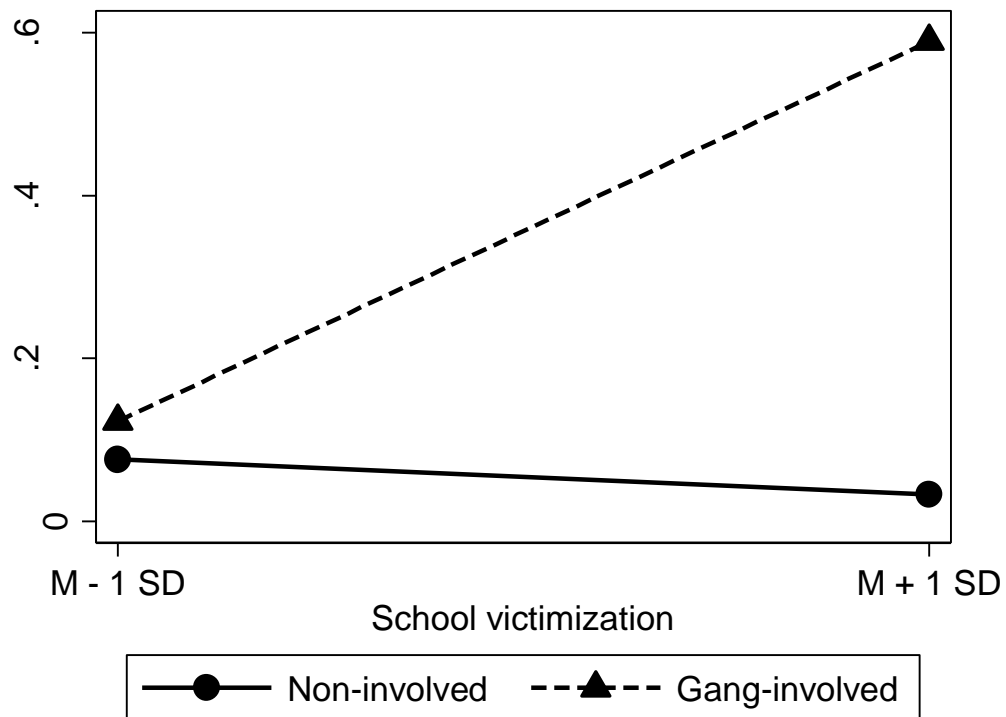
Figure 1.1. Gang involvement moderates the association between school victimization

and serious problem behavior
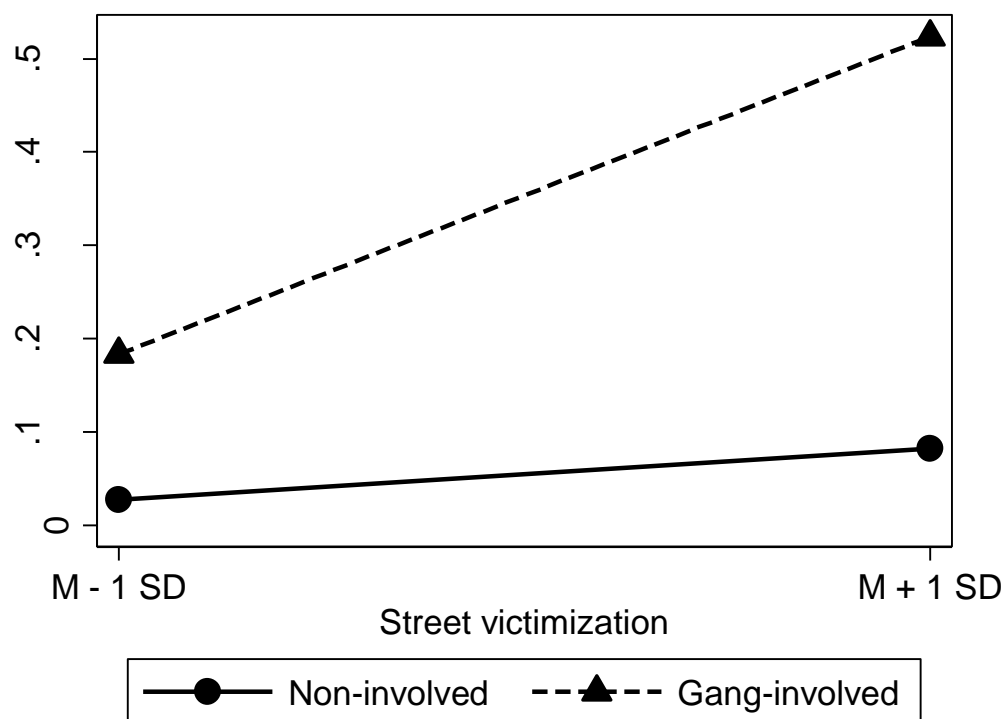
Figure 1.2. Gang involvement moderates the association between street victimization and

serious problem behavior
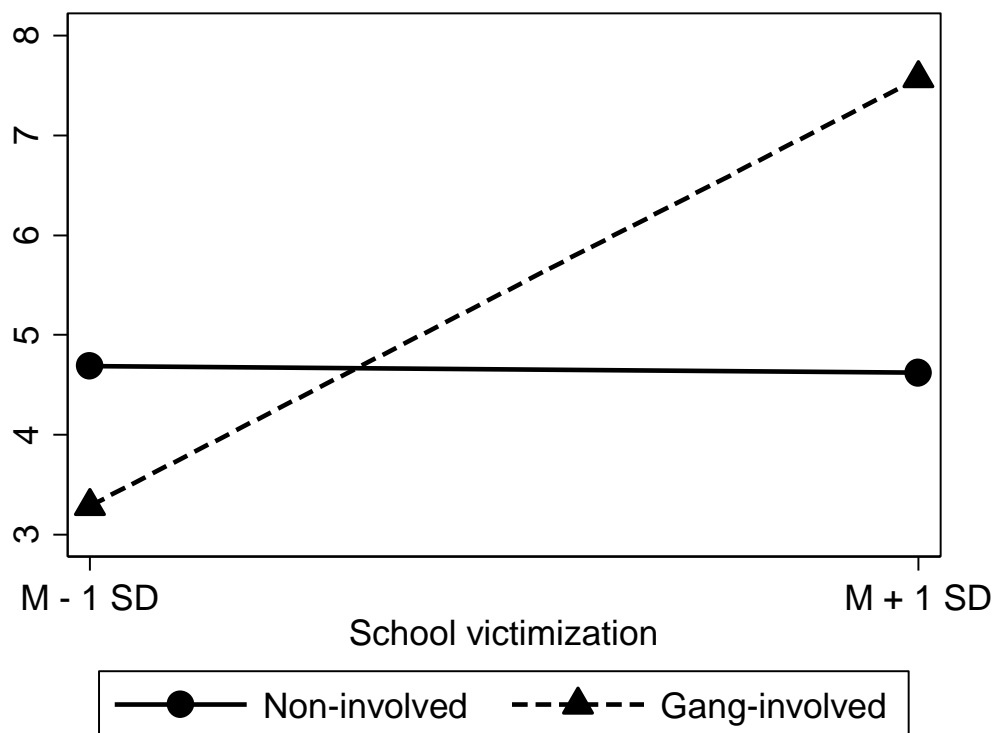
Figure 1.3. Gang involvement moderates the association between school victimization

and alcohol use
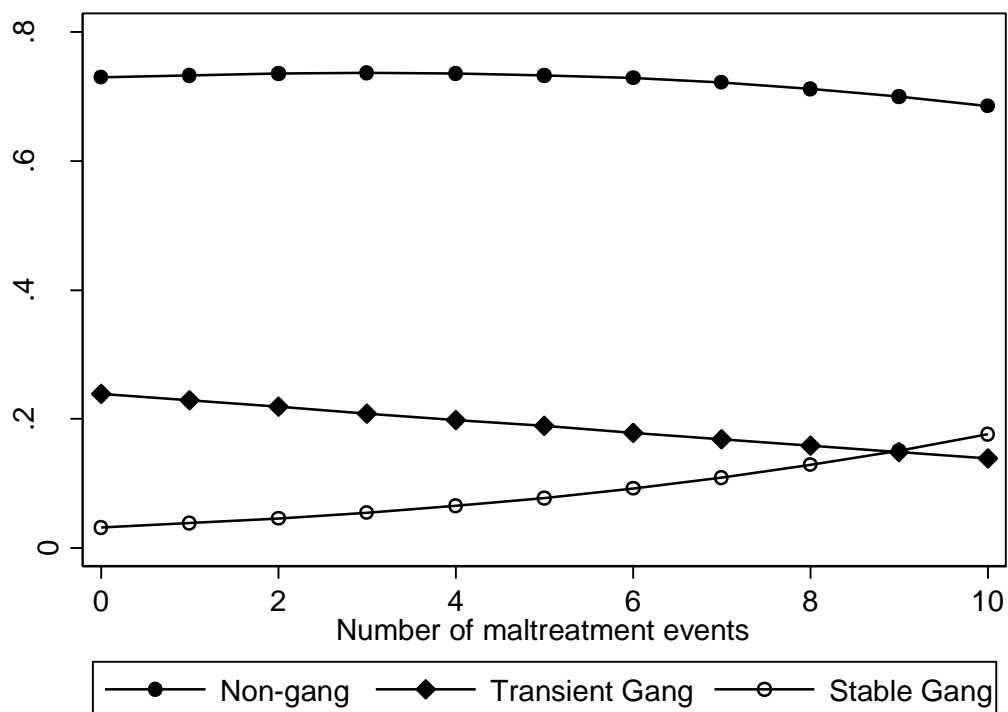
Figure 2.1. Impact of any maltreatment on gang involvement
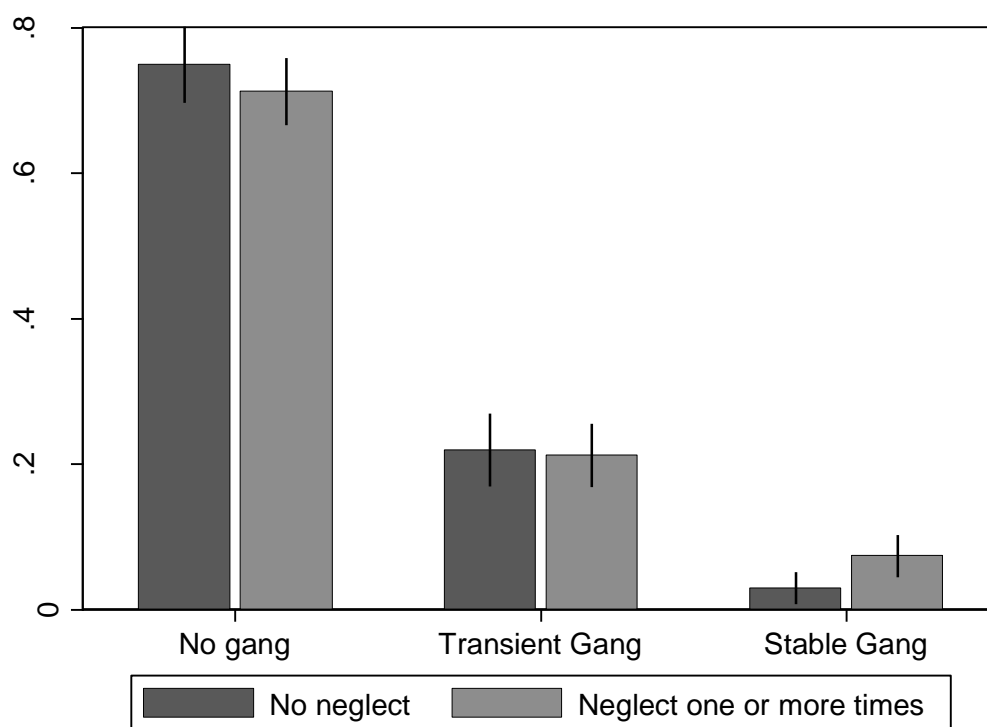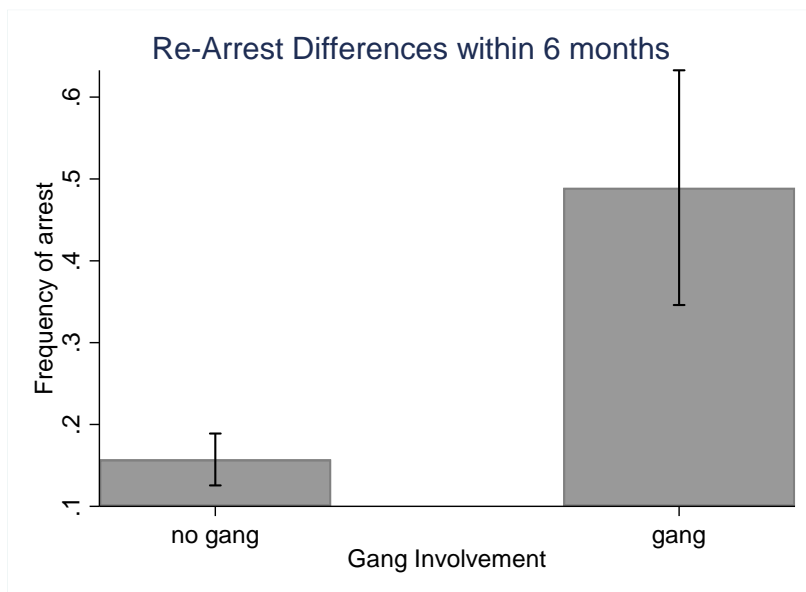
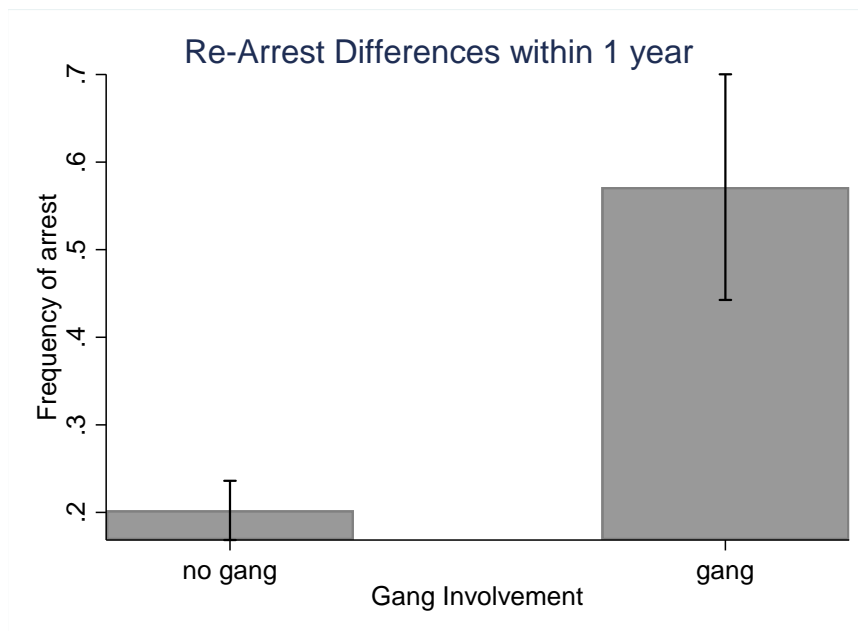Figure 2.2. Impact of neglect on gang involvement

Figure 3.1. Re-arrest differences by gang involvement within 6 months

Figure 3.2. Re-arrest differences by gang involvement within 12 months
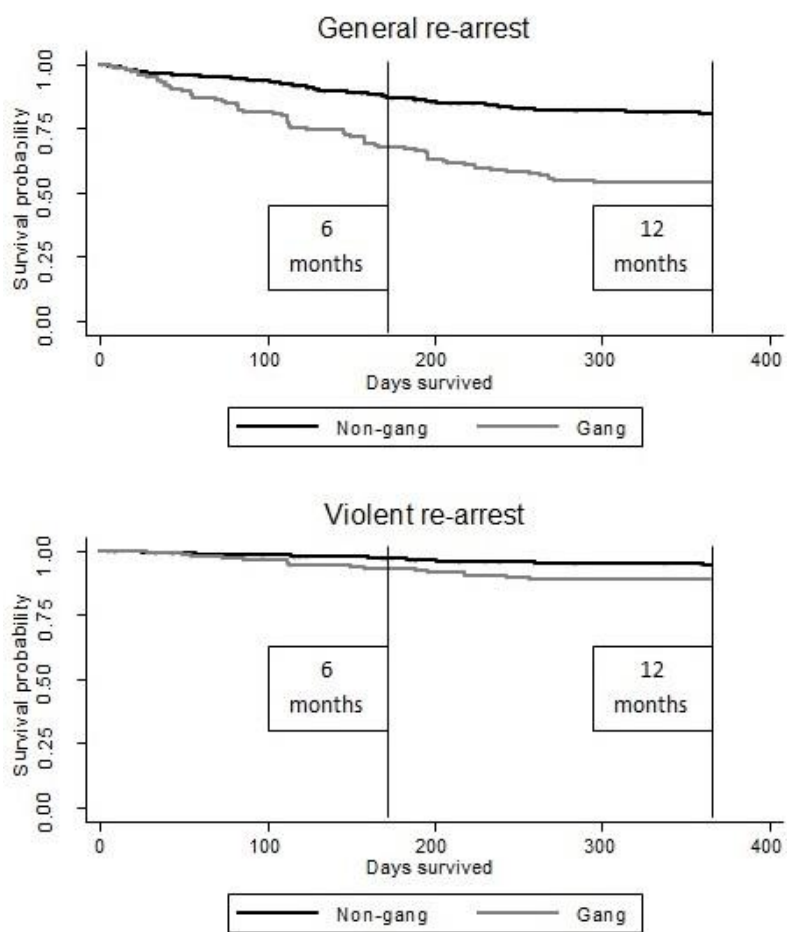
Figure 3.3. Survival analysis plots for gang involvement
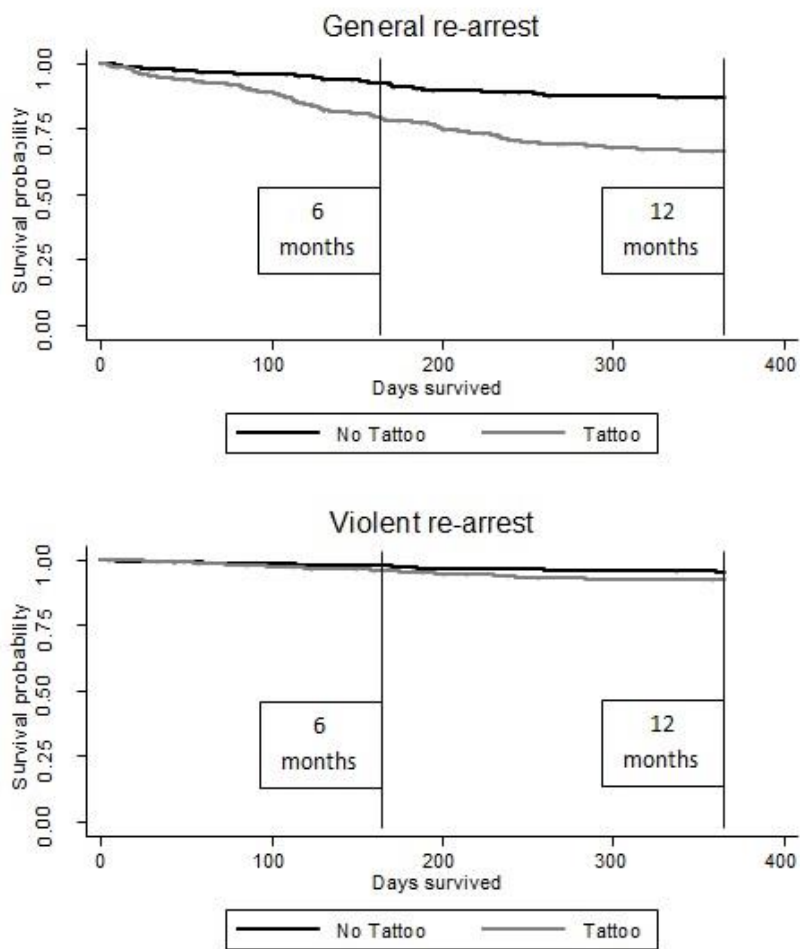
Figure 3.4. Survival analysis for tattoo presence
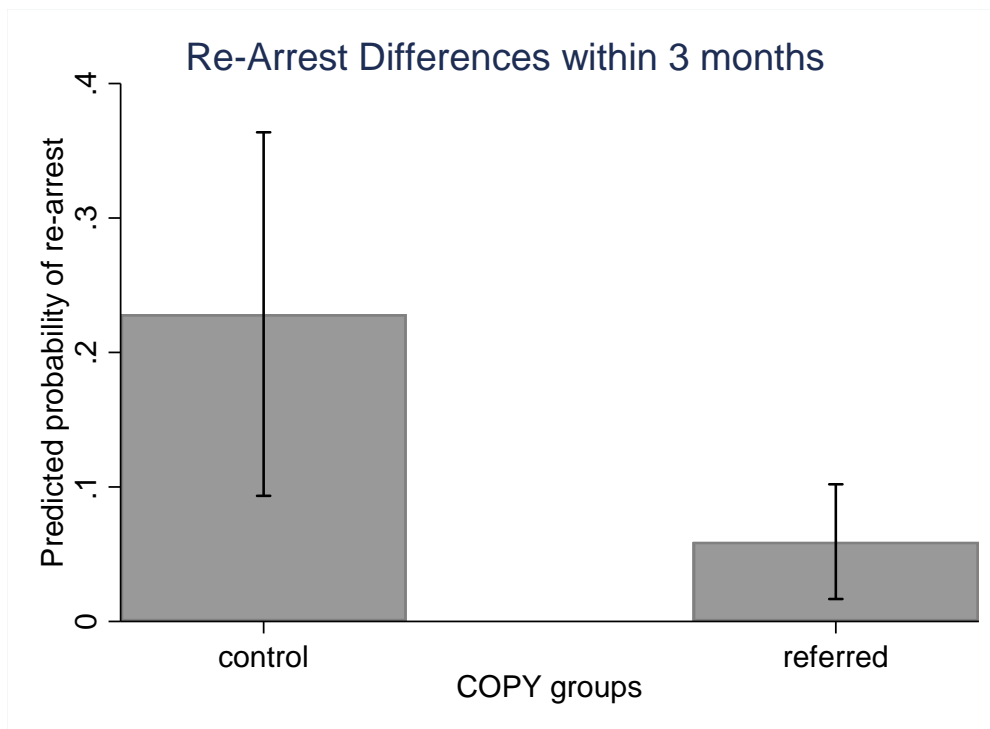
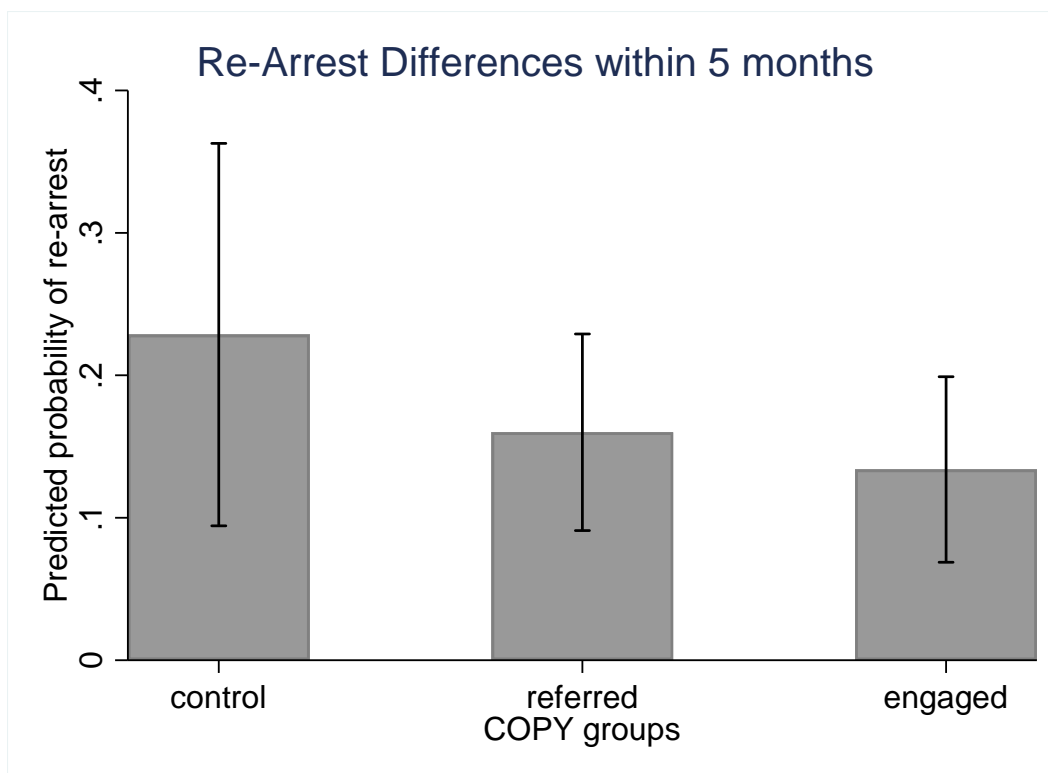Figure 4.1. Re-arrest differences within 3 month- referred vs. control group

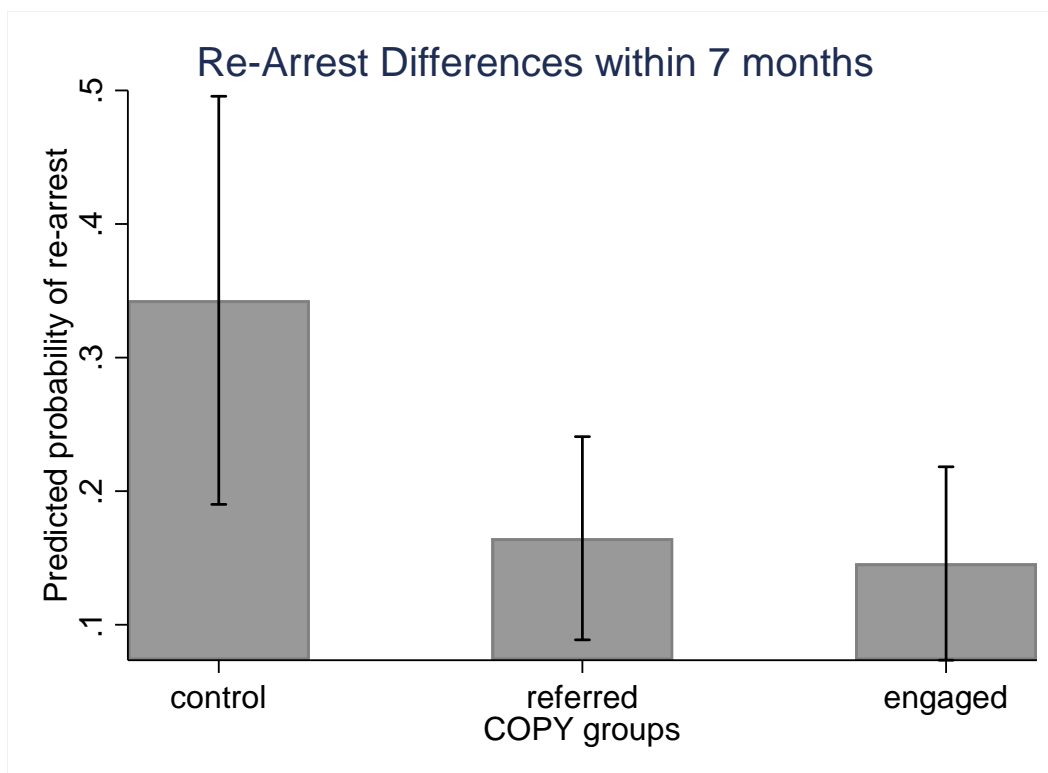Figure 4.2. Re-arrest differences within 5 months by COPY groups

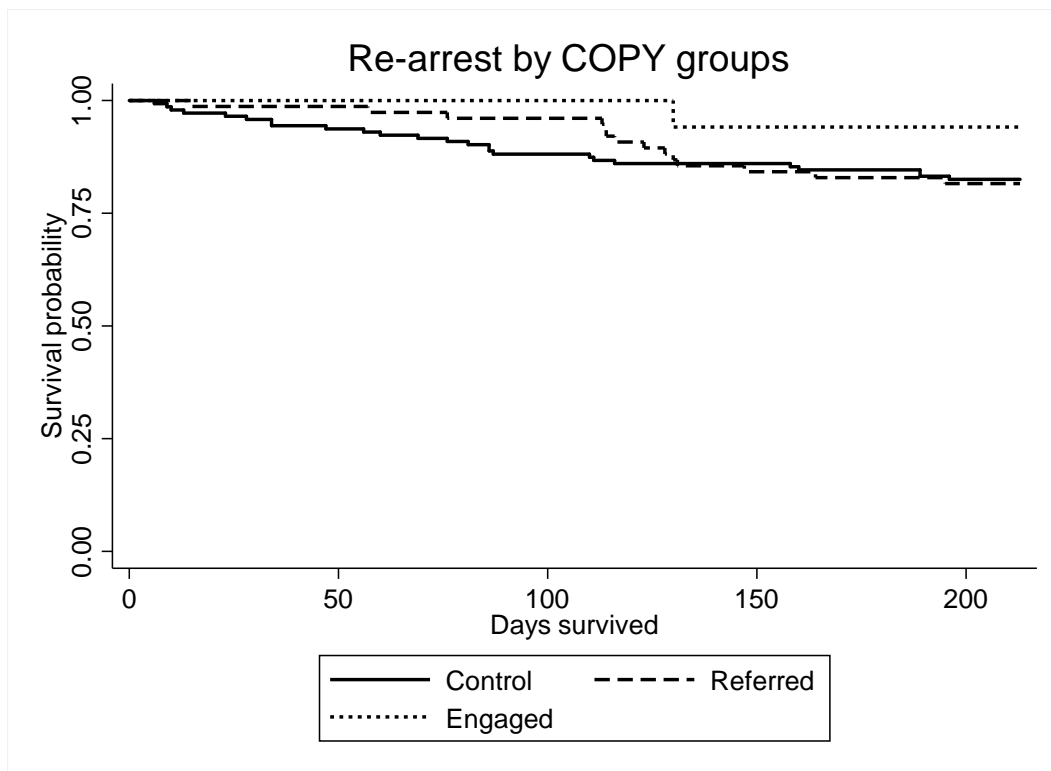Figure 4.3.Re-arrest differences within 7 months by COPY groups

Figure 4.4.Re-arrest by COPY groups