University of Cincinnati

Date: 1/22/2013

I, Brian K Lovins, hereby submit this original work as part of the requirements for
the degree of Doctor of Philosophy in Criminal Justice.

It is entitled:
Putting Wayward Kids Behind Bars: The Impact of Length of Stay in a
Custodial Setting on Recidivism

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UNIVERSITY OF
Cincinnati
Putting Wayward Kids Behind Bars:
The Impact of Length of Stay in a Custodial Setting on Recidivism

A Dissertation Submitted to the:
Division of Research and Advanced Studies
Of the University of Cincinnati

In Partial Fulfillment of the
Requirements for the Degree of

DOCTORATE OF PHILOSOPHY (Ph.D.)

In the School of Criminal Justice
Of the College of Education, Criminal Justice, and Human Services

January 22, 2013

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ABSTRACT

Over the past half century the juvenile justice system has seen significant shifts in its purpose. Originally designed to rehabilitate the youths in its care, the goals of the juvenile justice system began to expand to include community safety, retribution, and restorative justice. With a mix of goals and waning support for programming, out-of-home placements increased significantly. In fact, the number of youth placed in long-term custody between 1991 and 2000 doubled (Office of Juvenile Justice and Delinquency Prevention, 2008). Not only did the number of youths during this time period increase, there was a push for youthful delinquents to spend more time in these placements. These approaches led to the introduction of mandatory minimums and expanded gun and gang specification laws (Fagan, 2008). While more youths were being placed in out-of-home custody for longer periods of time, the juvenile justice system still lacked an understanding of how these changes impacted future delinquency. There was an assumption that longer stays resulted in more rehabilitation, safer communities, just desserts, and/or a restored victim. This current study sought to fill the void in the extant research by answering the question what happens to youth who stay longer in a custodial setting. Overall, youth who remained in custody for longer periods of time were re-incarcerated at significantly higher rates than those youth who stayed shorter periods of time. Results of this study can be used to provide insight into the impact that “get tough” approaches do not work for youths and under most circumstances lead to higher rates of recidivism.
ACKNOWLEDGEMENTS

The list of those that have touched my life over the past 10 years is long but I would be remiss to not start with my advisor, my mentor, my friend, Dr. Latessa. Lori and I recall often when we met Dr. Latessa. He is truly the reason that both of us are where we are today. Often it is said that one person cannot change a system, but I believe Dr. Latessa has done just that. You are truly one of the good guys and I want to thank you for all of your support over the past 10 years. I would also like to thank Dr. Smith. As I have told her many times, she sees the field from a unique perspective, one that translates theory to practice in a way that is helpful to both the practitioner and the clients they serve. In addition to her contribution to the field, Dr. Smith has been there at every turn of my dissertation and was instrumental in putting me on the path to finishing as the end seemed distant. Thank you very much. That leads me to Dr. Cullen. I know you did not have to offer to help—you have many commitments and this was just one more thankless task. I just want to say, you made a big difference and without your guidance I would still be thinking about what to write.

Dr. Travis was there from the very beginning. Guiding the initial RA study, ensuring that all t’s were crossed and i’s dotted. I cannot put into words how much I appreciate your help on my dissertation and your willingness to read this while on vacation with your family. Dr. Listwan, when I needed you, you were there—THANKS!

As I think back on my journey, there have been so many friends and colleagues that have moved into our lives that have had an impact on the way I see things today. Too many to name, but there are a few that stand out. Rob and Marie, Dave, Tamara, Emily, Charlie—I love you guys. My UCCI colleagues—I appreciate your constant encouragements and willingness to put
up with me over the past 10 years. I also want to thank Linda Modry and Craig Hubbard, who through all of this has continued to encourage and support my efforts.

No words can express the amount of love and gratitude I have for both Lori’s and my families. They have spent countless hours watching the boys, taking care of family activities, and always reminding me that I can make it. I could have not done it without you guys. Speaking of the boys, Sam’s ongoing desire to finish his dissertation along with mine always made me strive to be a good role model and teach him that if you set your mind to something you can accomplish it. If only I can be half as good of a parent to the boys as mine was to me, they will turn out great.

And last, but not least, my wife, Lori. It has been a long 10 years. I remember when I first discussed going to get my PhD and we decided to wait a year and go together. That was one of the best decisions I have ever made. I loved sharing every step with you and would not have wanted to do it without you. You inspire me to be a better scholar, a better person, a better husband, and a better father.
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CHAPTER 1: STATEMENT OF THE PROBLEM

Introduction

Over the past 50 years the juvenile justice system has seen a significant shift from its’ original purpose of rehabilitating wayward youth to one that is often more concerned about procedural justice, public safety, and the rights of the victim than the betterment of the youth in its’ custody (Zimring, 1998). The abandonment of a purely rehabilitative purpose to one with numerous goals has resulted in a mishmash of policies and practices that has had significant impacts on how the juvenile justice system operates. Under a rehabilitative model, the purpose of placing youth in custodial settings was solely to provide a structured environment to assist in the rehabilitative efforts of juvenile justice involved youth. Under a public safety model, youth are often placed in custodial settings based on the seriousness of their offense in order to protect the community, with minimal regard for the impact this placement has on the individual youth. Often, these goals are seen in conflict with each other and without a clear understanding of the impact of either, the number of juveniles held in custody more than doubled from 50,000 in 1991 to 108,000 in 2000 without any clear explanation as to the effects (Office of Juvenile Justice and Dependency Programs).

Interestingly, since 2007 there has been a dramatic decrease in the number of youth incarcerated. Again, not driven by any one goal, but mainly in response to a series of lawsuits challenging the conditions of juvenile facilities, a move to reduce the size of juvenile justice facilities, a greater understanding of adolescent development, and the looming fiscal crisis whereby states looked to cut discretionary spending (Holman & Ziedenberg, 2006). Ultimately, the juvenile justice system has been caught in a political whirlwind where policies are often not driven by data and research but by elections and bottom lines. The purpose of this dissertation is
to answer one part of the larger question: What is the impact on future criminal behavior for youth who are held in a state facility for longer periods of time compared to those who have shorter stays.

With a greater emphasis placed on public safety, legislators introduced “get tough” strategies that originated in the adult system during the mid-1980s to the juvenile justice system. The premise of these get tough strategies was two-fold. First, dangerous youth would be incarcerated for longer periods of time. Second, tougher sanctions would deter future crime. While many systems did not completely abandon rehabilitation, adopting these broader goals placed the focus on control versus change. These changes in approach led to an expansion of the waiver system, the development of blended juvenile/adult sentences, and the establishment of mandatory minimum sentences for felony offenders (Aaron, 2008; Fagan, 2008; Feld, 1993). By the year 2000, 60 percent of the states had expanded the ability of the court to waive a youth into the adult system through a combination of judicial, presumptive, and/or mandatory waivers (Adams & Addie, 2009b). The “get tough” approach was not just limited to those youth transferred to the adult system; but also for those who remained under juvenile jurisdiction. Probation was favored over diversion, while institutional commitments were often preferred over community supervision, and those committed to a facility were often held for significantly longer periods of time (Fagan, 2008).

The “get tough” movement was responsible for greater numbers of youth held in detention, placed on probation, sentenced to residential placements, and waived to adult court (Redding, 2010). In 1987, the average daily population in New York City detention centers was just over 110 youth. By 2001 it was up to 350 youth a day—resulting in a 218 percent increase over a span of 14 years (Juvenile Justice Project of the Correctional Association of New York,
Across the United States, the percentage of youth who received court-ordered probation increased 95 percent between 1985 and 2005, while those informally processed decreased 19 percent (Lipsey, 2009). The expansion of intensive interventions for youth was not limited to the community. Youth were often being placed in deeper-end custodial settings, and many were being waived to the adult system. In 1985, an estimated 7,200 youth were waived to adult court. By 1995, there were 13,000 youth across the United States that were waived to the adult system. Although varied across states, the national trend from the mid-1980s to the late 1990s was to use more intensive interventions to address juvenile delinquency (Mears, 2006).

**The Impact of Tougher Sentencing for Juveniles**

The results of the last 40 years of tougher sanctions resulted in a net-widening for youth at all stages of the juvenile justice system—but to what effect? While the extant literature on tougher sanctions for juveniles is surprisingly limited, there are a few studies examining the impact that tougher sanctions have on youth and juvenile crime rates. In one of the earlier studies on the impact of tougher sanctions, Fagan (1995) compared the differences in recidivism for youths in New Jersey who were bound over to the adult system to those youths in New York who stayed in the juvenile justice system. Specifically, he examined the impact that transfers had on youths who committed robbery versus burglary. He found that youths who had committed a robbery were more likely to recidivate if bound over to the adult system, but no differences for those youths who had committed a burglary. While it is difficult to understand why a person who is bound over on a robbery charge is more likely to recidivate as compared to a burglary, it does suggest that the type of crime the youths commit may be relevant in whether being waived to the adult system is more effective than remaining in the juvenile system.
While Fagan concentrated on the differences between burglars and robbers, Bishop, Frazier, Lanza-Kaduce, and Winner (1996) examined the impact on a broad sample of youths in Florida that were affected by a change in law that made it easier to bind a youth over to the adult system. Using an 18 month follow-up period they found that youths transferred to the adult system were more likely to reoffend, and those who did reoffend were quicker to reoffend and offended at a higher frequency than those youths who remained in the juvenile system. While the follow-up was relatively short, this suggests, at minimum, that transferring youths to the adult system may actually expose the community to more risk. Lanza-Kaduce, Lane, Bishop, and Frazier (2005) reanalyzed the Florida sample using a more stringent methodology for matching. Based on 475 matched pairs, juveniles who were transferred to the adult system reoffended at a significantly higher rate than their matched counterpart—suggesting that the deterrent effect of the tougher sanction did not lead to a reduction in future criminal behavior. In a follow-up study, Winner, Lanza-Kaduce, Bishop, and Frazier (1997) extended the tracking period to seven years. Similar to the original study, Winner et al. (2007) found that youths transferred to the adult system experienced significant increases in rearrests and time to reoffending was shorter—the only exception they found was for youths who were charged with property offenses, who experienced lower recidivism rates. While property offenders who were bound over were less likely to reoffend than their counterparts, those that did reoffend committed more offenses and were arrested quicker than those youth treated who remained in the juvenile system.

In addition to examining the impact of tougher sentences at the individual level, there have been a few studies that have examined the impact of tougher sentences on juvenile crime rates at the macro level. Singer and McDowall (1988) found that when New York State
expanded the waiver eligibility age to 13 for murder and 14 for other violent acts, there was no marked reduction in the juvenile violence rate. In a state-to-state comparison, Jensen and Metsger (1994) conducted a time series analysis that compared the impact that expanded waivers had on violent crime rates for juveniles. They compared Idaho, which had recently made it easier to waive a youth to the adult system with Montana and Wyoming. They found that Idaho experienced a 13 percent increase in juvenile violent crime rates compared to Montana and Wyoming during the same time period. Assuming that Montana and Wyoming provide an adequate comparison group, it can be assumed that expanding the waiver system had no deterrent effect and may actually have had the opposite effect.

While previous research had focused on single states, or comparison of one state to another, Steiner and Wright (2006) examined the impact that direct file laws had across the United States on violent juvenile crime rates. They found that harsher transfer laws have no general deterrent effect for juveniles. In contrast, Levitt (1988) found that states in which the adult court had significantly harsher penalties than its’ juvenile counterpart had lower violent crime rates—suggesting that harsher adult laws may deter youth from engaging in violent crime as they cross over to the age of majority.

While most of the studies have examined the impact of expanded waivers, there have been a handful of studies that examined the impact of placing youths in a juvenile facility versus community supervision. The first, by Loughran, Mulvey, Schubert, Fagan, Piquero, and Losoya (2009) used propensity scores to match youths who were placed on probation to those placed in custody. They found that youths placed on probation were re-arrested at a slightly lower rate than those placed in custody, suggesting that placing youth in prison has no marked effect on recidivism. In the second, Giguere (2005) examined the impact that custodial placement had on
youths as compared to probation services. She found no difference in long-term recidivism between youths placed in custody compared to those on probation, but did find that youths who were incarcerated experienced a short-term amplification of re-offending upon release.

As for the impact of longer custodial stays, there have been several studies that have examined the length of stay on re-offending. Haapanen, Britton, and Crosidale (2007) examined the impact more intensive sanctions, defined as longer stays for youths in the California Youth Authority, had on future recidivism. They found that youths who were released at an older age were significantly less likely to return to incarceration—concluding that longer sentences resulted in a disruption of persistent criminal trajectories. Similarly, Loughran et al. (2009) found that youths who served sentences between 3 and 13 months experienced no significant difference in re-offense rates and it was not until a youth stayed at least 14 months that she or he experienced an increase in recidivism. In contrast, Winokur, Smith, Bontrager, and Blankenship (2008) examined the impact of length of stay on recidivism by the type of facility in which the youth were housed. They found that for lower risk youths placed in lower risk facilities, there were no differences for youths who stayed longer versus youths who had shorter stays. However, they did find that youths housed in high risk facilities did better when held between 13 and 20 months; and once youths were housed beyond 20 months, the effects began to dissipate. While the extant research will be explored in greater detail in the following chapters, these initial studies begin to paint a mixed picture of the effects of harsher sanctions, especially for juvenile delinquents.

**Recent Trends in the Juvenile Justice System**

As the juvenile justice system responded to the uptick in juvenile crime with tougher sanctioning and increased focus on community safety, it has similarly responded to substantial
budget shortfalls, reports of abuse, corruption, and inadequacy in reducing recidivism by significantly reducing the use of custodial placements (Mendel, 2011). Over the course of the last 10 years, states have taken several steps to reduce the number of youth housed in large custodial settings. While some offered that this would result in a significant backlash of higher crime rates, those states that have reduced their high-end commitments have not seen an increase in juvenile offending; in fact, many of the states have experienced a decrease in juvenile violent crime. For example, California had an 85 percent decline in incarcerated youths, and experienced substantially lower juvenile crime rates over the course of the same time period (Mendel, 2011). This phenomenon is not unique to California. Since 2007, Texas has seen a 10 percent reduction in felony arrests while the number of youths in custodial placements has decreased by 63 percent (Texas Department of Public Safety, 2010).

Although many juvenile advocates would praise California and Texas in their reductions of incarcerated youths, these changes are once again driven more by external forces than through a planned approach to reduce recidivism by placing youths in the appropriate setting based on the needs of the youths. As noted in the previous sections, the juvenile justice system is often guided by political responses, knee-jerk responses to a temporary spike in crime, or a sensationalized crime and less by what is in the best interest of the youths. In fact, the juvenile justice system often applies anecdotal fixes to a current problem without an understanding of the theoretical basis for these changes (Latessa, Cullen, and Gendreau, 2002). This dissertation is designed to overcome limitations of existing research by controlling for risk, ensuring variation on length of stay across groups, and having a significant follow-up period. Ultimately, this dissertation will provide juvenile justice stakeholders with a clearer understanding of the impact that longer stays have on the impact of future recidivism.
Theories of Incarceration for Juvenile Offenders

The current theories of incarceration are categorized into four schools. First, custodial placements increase recidivism—suggesting that custodial settings are schools of crime and youth placed in these facilities are destined to get worse (Lilly, Cullen, & Ball, 2010). While there are several theories that would explain how custodial settings would make youth more criminal, labeling theory provides one explanation. Labeling theorists propose that youth that are exposed to the juvenile justice system (and even more specifically to prison) are tagged as delinquent, the youth then begins to believe that s/he is delinquent (and cannot change), and subsequently engages in more deviant behavior post-release (Becker, 1963).

Second, custodial placements reduce recidivism. The primary theory that explains the ability of custodial placements to reduce recidivism is specific deterrence theory. Those that believe incarceration of youth will have a deterrent effect on future criminal behavior directly refute the school of crime notion. In fact, deterrence theory would suggest that the speed at which punishment is meted out, the more severe, and the more consistent the punishment, the less likely the youth would engage in that behavior again (Becker, 1968). For example, long mandatory minimum sentences, like mandatory gun specifications, should result in lower recidivism rates.

Third, placements have no long-term effect on recidivism, that the only effect is a temporary incapacitation effect (Sweeten & Apel, 2010). While there are no studies that examine incapacitation specific to youth, Zamble and Porporino (1990) found that for most adult offenders sentenced to prison, inmates experience a “psychological deep freeze” in which their behaviors return to baseline post-release.
Fourth, custodial placements have mixed effects. The effects of prison may vary depending on characteristics of youth, type of crime, age, race, and risk level or the availability of effective treatment services. If true, this would account for some youth experiencing a reduction in recidivism, while others that are placed in custodial settings experience no change or even potentially more detrimental an increase in recidivism.

To this point, the field does not have a definitive answer on the impact of longer stays in custodial settings on youth. One of the major limitations in understanding the impact of length of stay on youth is that many of the changes are a theoretical, driven more often by politics and external pressures than by results. This dissertation sets forth to answer the following research questions:

- What impact, if any, do longer stays in a custodial setting have on youth?
- Do longer stays have differential effects on recidivism based on the youth’s risk, age, race, or gender?

**Summary**

While tougher sanctions for juveniles have been enacted in an effort to reduce recidivism and to protect the community, it is not clear that these policy changes have resulted in reductions in recidivism, which in turn, may have no effect on community safety. In an effort to understand the impact of these changes, this chapter has provided a synopsis of the changes the juvenile justice system has faced over the past 30 years. In addition, a brief review of the empirical literature was conducted to understand the impact that these changes have had on juvenile offenders. While the empirical literature suggests that expanding the waiver system does not have a deterrent effect on recidivism, there is limited evidence to suggest that longer stays in custodial settings result in a reduction of recidivism. This dissertation will examine the
relationship between length of stay and recidivism for youth placed in a juvenile correctional facility. Moreover, it will explore if the effects of length of stay on future criminal behavior differs based on gender, race, age, or risk.
CHAPTER 2: LITERATURE REVIEW

What Do We Expect From Prison?

Although the use of incarceration has been a core function of the criminal and juvenile justice systems for the better part of two centuries, there is no definitive answer as to its ability to reduce future criminality. The extant research is mixed regarding the impact that prisons have on the crime rate. Some studies demonstrate that prison has a positive impact on the crime rate (see Marvell, & Moody, 1994; Fabelo, 1995; Levitt, 1998), others find that prison can actually make offenders worse (see Clear, 1996; Gendreau, Goggin, Cullen, & Andrews, 2001 ), and still others report no substantive effect (Nagin, Cullen, & Jonson, 2009). Ultimately, knowing the impact that prison has on those incarcerated is necessary to inform future public policy.

As discussed earlier, criminological and sociological theories diverge regarding the impact prison has on recidivism, culminating in four broad perspectives. First, prisons decrease crime. That is, offenders who go to prison reoffend at lower rates compared to those who remain in the community, suggesting that the prison experience deters future criminal behavior. Second, prisons increase crime. These theories offer that people who go to prison will engage in more crime post-release, not less crime. Third, prisons have no effect. These theories suggest that prison is a holding ground, “a psychological deep-freeze,” where offenders come out relatively similar as they went in. Low risk remain low risk, high risk remain high risk. Fourth, the effects of prison vary depending on a host of mitigating circumstances. These theories suggest that the setting, characteristics of the offender, and the application of treatment are mitigating/aggravating factors associated with the prison’s ability to reduce future crime. The next section will examine the theories that contribute to each of these perspectives, as well as the empirical evidence.
Prisons Decrease Crime

One of the primary roles of prison is to provide a “severe” sanction for people that engage in criminal behavior in an effort to deter future antisocial behavior. Anecdotally, people believe that prisons inflict discomfort on offenders and thus teach them that crime does not pay (Reynolds, 2000). Legislators and policy makers are no different. McLatchey (1999) found that even in the juvenile system where rehabilitation is generally supported, lawmakers are inclined to rely on incarceration as the primary answer to a rising crime rate, assuming that “get tough” approaches will have a positive impact on reducing crime. Approaches like these are based in deterrence theory. General deterrence suggests that people can learn that the cost of crime is too high by observing the punishment of others. Specific deterrence focuses on the impact that punishment has on those involved in the criminal justice system, positing that offenders are less likely to engage in similar acts if the cost of being caught exceeds the benefits of the criminal behavior (Becker, 1968).

Although economists usually study general deterrence, it can be argued that offenders who have experienced punishment are even more affected by weighing the cost and benefits of their actions because they have direct and indirect knowledge of the punishments available (Lempert, 1982). Based on a specific deterrence model, if the benefits of engaging in criminal behavior are high and the chance of getting caught is low, the offender will choose to engage in the crime. Conversely, if the costs of engaging in criminal behavior are higher than the benefits, future crime will be suppressed. Although easy to state in theory, it becomes more difficult to test. Since the cost of prison is greater than just being removed from society, researchers have suggested that incarceration has direct costs, as well as indirect costs (Nagin, 1998; Orsagh & Chen, 1988; Pyle, 1995; Wood & Grasmick, 1999). The direct costs of prison include loss of
financial opportunities and loss of goods and commodities. While these are easy to measure, the indirect costs of prison are tougher to measure. These include a loss of freedom, relationships, and connections with loved ones, and of course the impact that going to prison has on the individual’s psychological well-being (Clear, Rose, & Ryder, 2001).

Understanding the process by which offenders make decisions is important, especially when there is a potential for prison. Based on deterrence theory, offenders who contemplate committing a crime will first find themselves asking the following: What are the chances of getting caught? Although more applicable for the earlier stages of the criminal justice system, certainty of punishment is directly related to the likelihood of an offender being caught and sent to prison (Jonson, 2010). Specific deterrence suggests that the less certain the punishment, the more likely the individual will choose to engage in crime. Applied to a prison setting, the less likely the person is to lose their freedom by being sentenced to prison, the more likely the offender is to recidivate.

The second calculation performed by the offender under a specific deterrence model is: “How long will I get?” Specific deterrence suggests that offenders engage in a cost benefit analysis regarding how much will be gained from the crime juxtaposed with the length of sentence imposed. For example, drug dealers have been known to calculate how much money they can make in the short run to offset the cost of imprisonment. This suggests that if the sentence length was increased so that the cost of prison was greater than the benefits of the crime, offenders would not continue to commit crimes.

The third consideration is: “How bad can it be?” As offenders receive harsher sanctions they are more likely to discontinue future crime. The implication is that the more the prison experience is distasteful to the offender the more likely it is to have a deterrent effect. More
recently, criminologists have applied the principles of rational choice theory and “thoughtfully reflective decision making” (TRDM) to also explain how adolescents make choices regarding delinquent behavior (Becker, 1968, McCarthy, 2002, Paternoster & Pogarsky, 2009, Maimon, Antonaccio, & French, 2012).

Although macro-level studies have shown some support for general deterrence, individual-level studies have not found similar support for specific deterrence. To understand the impact of prison on recidivism for individual offenders, previous reviews of the extant literature have divided the effects of prison into three categories (see Smith et al, 2002; Jonson, 2010). First, researchers have compared offenders who were sentenced to prison to those that received an alternative sanction. Second, previous research has examined the effect that longer sentences have on recidivism compared to shorter prison stays. And third, researchers have examined the conditions to determine if harsher conditions are more likely to impact recidivism. If prisons are effective mechanisms in applying specific deterrence, it would be expected that those who experience prison reoffend less than those who remain in the community. In addition, those that receive longer sentences would reoffend less, and that those who serve time in the harshest of conditions will be the least likely to engage in future criminal behavior. The following sections will provide a review of the empirical evidence that examines the effectiveness of specific deterrence in addressing recidivism.

Prison versus Alternatives to Incarceration. Although it is often argued that prison is an effective deterrent for reducing recidivism, the research is not generally supportive of this perspective. Five literature reviews have been conducted on the extant literature regarding the effects of prison versus alternatives to incarceration (Gendreau, Goggin, Cullen, & Andrews, 2001; Smith, Goggin, & Gendreau, 2002; Villettaz, Killias, and Zoder, 2006; Nagin, Cullen, and
Jonson, 2009; Johnson, 2010). The early studies showed a similar effect; prison does not have a marked impact on recidivism. In fact, prison actually increased recidivism by seven percent compared to those who received alternatives to incarceration (Gendreau et al. 2001; Smith et al. 2002).

More recent reviews have discovered similar results. Using a ballot box approach, Villetazz et al. (2006) found that out of nearly 300 studies, only 7 percent found a positive effect for incarceration over community placements. Moreover, 52 percent of the studies found that incarceration actually increased recidivism. One limitation of this study was the inability to tease out the impact that less than rigorous studies had on the results, specifically the inability to control for risk of the offenders. As a result of this limitation, Killias and Villetaz (2008) conducted a meta-analysis on a subsample of the studies that used an experimental design. Based on this subsample, they concluded that there were no significant differences between offenders who were sanctioned to custody versus those who remained in the community. Similarly, Nagin, et al. (2009) found that incarcerating offenders has little impact on future recidivism. Reexamining Nagin’s et al. (2009) work, Jonson (2010) found a 14 percent increase in recidivism for offenders who received prison over an alternate placement. The primary difference in Jonson’s review over Nagin’s was that Jonson limited the study to methodologically sound studies, while Nagin had included a broader array of studies.

**Longer Stays versus Shorter Stays.** The literature is equivocal on the impact that length of stay has on recidivism. Some studies show that length of stay has no impact on recidivism. Beck and Hoffman (1976) found no significant differences in recidivism based on longer sentences while controlling for risk to recidivate. Other studies have shown an increase in recidivism. For example, Gottfredson, Neithercutt, Nuffield, and O’Leary (1973) found that
longer prison stays generally reflected increased recidivism rates. While other studies have shown that it depends on the type of offense and length of sentence. Although Gottfredson et al. (1973) found that longer sentences equated to higher recidivism rates, they did find that offenders who were incarcerated for armed robbery and drug offenses were slightly less likely to recidivate when longer sentences were imposed. Moreover, Orsagh and Chen (1988) found that as offenders approached 1.2 years of confinement recidivism rates continued to decrease, but serving more than 1.2 years resulted in increased recidivism rates.

Even the results of meta-analyses have been mixed. There have been four meta-analyses conducted over the past 10 years on the impact that sentence length has on recidivism; three of which suggest length of stay has limited impact, while one found that longer stays were correlated with slightly lower recidivism rates. Gendreau et al. (2001) and Smith et al. (2002) found that increasing the length of stay for offenders has no marked effect. Similarly, Nagin et al. (2009) found that offenders receiving longer sentences experienced no difference in recidivism compared to those serving shorter lengths of stay. Contradicting the results of earlier meta-analyses, Jonson (2010) found that increased length of stay for offenders resulted in a five percent decrease in recidivism. While the results of the extant research are mixed, it appears that most findings suggest that longer periods of incarceration do not result in significant reductions in recidivism.

**Harsh versus Less Harsh Conditions.** Based on deterrence theory, it would be assumed that harsher conditions of confinement would deter offenders from returning—ultimately reducing recidivism. Smith and Gartin (1989) suggest that under a deterrent model, harsher environments will lead to lower recidivism rates because inmates will learn that prison is not pleasurable and therefore will be less likely to return. This belief led some state legislatures to
support a move to a no-frills prison system—removing many of the “amenities” like weightlifting, smoking, personal effects, and even advanced education (Finn, 1996). In contrast to a deterrence model, Clemmer (1940) suggests that the harsher prison environments will have a negative impact on how inmates behave—both during their custodial stay and post-release. He points to the process of “prisonization” or the adoption of the prison culture as having lasting effects as inmates are released to the community. Recently, Blevins, Listwan, Cullen, and Jonson (2010) have applied general strain theory to explain why harsher environments may actually cause offenders to get worse not better. They posit that the denial of privileges can actually cause additional strain for offenders—denying them from meeting their goals of personal achievement. Ultimately, this is a question that can be put to empirical test—do harsher environments reduce reoffending?

The difficulty in answering this question is that the empirical literature on the impact of harsher conditions on recidivism is limited. Some studies have used a general deterrence model examining the impact of harsher environments on the aggregate crime rate. Katz, Levitt, and Shustorovich (2003) examined the impact that harsher conditions had on future recidivism. Similar to other studies, measuring conditions of the prison can be difficult. Katz et al. (2003) were limited by the data to measure harsh conditions by the death rate of each facility. While it does not specifically measure harshness, it does provide a proxy for adequate healthcare, the rate of murders and suicides. Katz et al. (2003) found a slight but significant relationship between higher death rates and aggregate crime rates—suggesting the harsher prison environments equate to lower crime rates. Bedard and Helland (2004) examined the impact of harsher prisons on female crime rates. Using the distance of prisons from city centers (assuming that the greater
distances resulted in fewer visits) as their measure of harshness; they found that as female prisons were located further from city centers crime rates for females decreased.

There are obvious limitations to these studies in answering the question of specific deterrence, the primary of which is that these studies often commit an ecological fallacy, suggesting that harsher prison conditions will have an impact on overall crime rates. If there was a deterrent effect for harsher environments, it would be expected that the impact would be on those individuals who are placed in harsher environments. In examining the individual effects of harsher prisons, Drago (2011) used a sample of 20,900 Italian inmates to examine the impact of harsher prison settings on future offending. To determine a prison’s level of harshness, he used a combination of overcrowding and in-custody deaths. While there was no formal control for risk, he did control for factors that are generally correlated with recidivism including gender, marital status, education, most recent offense, employment status at arrest, and the current sentence. He found that inmates placed in harsher settings were more likely to reoffend—not less. Chen and Shapiro (2007) compared offenders who were housed in high custody settings versus those that were in minimum custody settings and examined the differences in recidivism—suggesting that higher custody settings translate to lesser frills or harsher conditions. They found that those in high custody settings were slightly more likely to recidivate than those who experienced greater freedoms of the lower custody settings. Comparatively, Listwan and colleagues (2013) refuted deterrence theory with their study which found that those who experienced victimization and perceived the prison environment as hostile were more (not less) likely to return to prison post release.

Summarizing the impact of prison conditions on recidivism, Jonson (2010) found a 15 percent increase in recidivism for prisons that maintain harsher conditions. Although these
findings do not support specific deterrence, the results should be interpreted with caution due to several limitations of the original studies. First, only 11 of the 85 studies included in the meta-analysis measured any degree of harshness. For those that did measure harshness, it was typically limited to level of custody. Second, the original studies were not able to control for individual factors of the inmates, including race, gender, age, and risk. Therefore, if individuals respond differently to harsh conditions as Chen and Shapiro (2007) suggests, not being able to control for these individual characteristics will have significant effects on the impact that harsher conditions will have on future recidivism.

**Prisons Increase Crime**

As discussed in the first section of this chapter, there are four perspectives that describe the potential effects of prison. This section describes theories that hypothesize that prisons increase recidivism for those who are not only sentenced to prison, but also those who stay longer in prison. Generally, these theories suggest that prisons operate as “schools of crime,” suggesting that inmates become more criminal as they are exposed to prison. That is, inmates can become more criminal by interacting with criminal others, receiving increased reinforcements for engaging in antisocial behavior, losing connections to prosocial others, or experiencing social stigma associated with prisons. Social learning theory will be explored to understand how it can offer an explanation regarding the impact of prisons on recidivism. In addition to social learning theory, labeling theory, age-graded social bonds, and general strain theory will be discussed and the empirical evidence reviewed on the potential impact that prison has on offenders.

**Social Learning.** As discussed in the previous section, deterrence theory suggests that sentencing an offender to prison should decrease the likelihood that this person will engage in
future criminal behavior. Social learning theory predicts that as offenders are exposed to prison, and specifically to other inmates, they become more criminal, not less. One common criticism of prison is that inmates do not learn to be prosocial or come to fear punishment, but instead they learn how to be better criminals. Assuming that offenders get worse, social learning theory suggests that the negative impact of prison can be explained through reinforcement, differential association, adoption of antisocial definitions, and imitation (Akers, 1977). Each of these constructs is discussed below and the empirical evidence reviewed.

Reinforcement. Reinforcement is defined as any response to a behavior that strengthens that behavior (Skinner, 1945, Watson, 1913). Reinforcement can be delivered in the form of a positive reinforcement (e.g., verbal praise for engaging in a prosocial activity), or as a negative reinforcement (e.g., removing an undesired restriction for performing a desired behavior). Behaviorists argue that behavior is reflexive—that is, behavior is shaped specifically by external stimuli. To explain crime, a behaviorist would posit that criminal behavior is strengthened when an offender commits a crime and subsequently avoids detection. For example, when a person is late for a meeting, exceeds the speed limit and subsequently does not receive a ticket. If the person makes it to the meeting on time without punishment, the behavior is reinforced. The more the person exceeds the speed limit and avoids detection, the more the person speeds. The behavior is strengthened, not by the content of the driver’s thoughts, but by the response he or she receives.

While Skinner and Watson would suggest the driver’s behavior is solely shaped by the positive reinforcement received for arriving to the meeting on time, Bandura (1978) would suggest that the driver’s behavior is also influenced by his or her thoughts. He posited that human behavior was more complex than a series of external stimulus/response patterns—that
behavior is conditioned through a person’s thoughts as well as the external responses. Moreover, he suggested that offenders who are motivated to continue criminal patterns are more likely to engage in future illegal behavior. Burgess and Akers (1966) further extended these concepts by incorporating additional components of operant conditioning. Specifically, Burgess and Akers (1966) suggest that offenders’ behaviors are shaped not only by the reinforcements they receive but also the punishments. These reinforcements can come from their social network or the reinforcing nature of the act itself. For example, offenders who use drugs find the behavior instantly gratifying; therefore, they are more likely to continue that behavior (Burgess & Akers, 1966). The assumption that behavior is strengthened by external stimuli as well as cognition is the foundation of differential association and later social learning theory.

**Antisocial definitions.** Although not described in detail by Sutherland, antisocial definitions, or definitions favorable of crime, are generally associated with values and beliefs that make it acceptable to commit crimes. Sykes and Matza (1957) suggest definitions favorable of crime are comprised of techniques of neutralization, designed to overcome laws and prosocial norms. These neutralization techniques include denial of responsibility, injury, and harm to the victim. As people are exposed to a greater density of definitions favorable to crime (neutralizations), they are more likely to adopt those neutralizations as their own (Sutherland, 1947). Depending on the individual’s level of connectedness with the intimate others, he or she begins to adopt similar values and beliefs (Akers, 2009). Prisons have a higher concentration of offenders who have definitions that are unfavorable towards the law (Latessa & Allen, 1999; Shaw, 1930; Bonta & Gendreau, 1990). As individuals attach to social networks within prison, it is significantly more likely that they are going to be exposed to, and eventually adopt, the attitudes and values of their peers.
**Differential association.** Sutherland (1947) first introduced the concept of differential association; suggesting that as a person interacts with intimate others he or she is exposed to the group’s definitions of behavior, cultural norms, and values. He further posited that exposure to intimate others would have a varied impact on a person depending on the frequency, duration, priority, and intensity of the interactions. While generally applied to criminogenic learning that occurs within communities, consider an environment like prison. Offenders are forced to interact at a high frequency with other offenders. These offenders often carry with them definitions favorable to crime. Moreover, inmates are often placed in situations where they are dependent on a peer group for safety and security, increasing the intensity of the relationships (Gaes, Wallace, Gilman, Klein-Saffran, and Suppa, 2002). And with longer sentences, an individual is exposed to definitions favorable to crime not only in a more concentrated dose but also over longer periods of time. The combination of frequency, intensity, duration, and exposure to favorable definitions of crime could explain the impact prison has on future criminality.

**Imitation.** Imitation is copying or the replication of behavior observed in others. Bandura (1977) suggests that individuals are more likely to adopt behaviors similar to those around them if they are attentive to the behavior, are able to commit the behavior to memory, have the skill to perform the behavior, and are motivated to continue. These steps suggest that as offenders learn new criminal behavior and then rehearse it, the behavior becomes more habitual and eventually is adopted as their own (Cloward and Ohlin, 1960; Jeffery, 1965).

The components of social learning theory led many criminologists to suggest that prisons are environments that can have a negative impact on offenders (see Latessa & Allen, 1999; Shaw, 1930; Bonta and Gendreau, 1999; Warr and Stafford, 1991). All the prerequisites are present: criminal others, an abundance of antisocial values and beliefs, opportunities for
modeling and imitation, behavioral rehearsal, and reinforcements or punishments from the surrounding networks (Akers, 2009). Not only does social learning theory suggest that prisons are criminogenic, but also the extant research offers support for social learning theory in explaining crime. Akers, Krohn, Lanza-Kaduce, and Radosevich (1979) found that youth who were more likely to associate with peers who use drugs are reinforced for their drug use and have attitudes that support drug use were more likely to engage in drug use. Moreover, Bayer, Hjalmarsson, and Pozen (2009) found that youth committed to a juvenile facility were more likely to recidivate if they established relationships with peers at the facility who engaged in similar behaviors. In addition to individual studies supporting social learning theory, Pratt and Cullen (2000) conducted a meta-analysis examining competing criminological theories, including social learning theory. Pratt and Cullen (2000) concluded that social learning theory had a significant impact on recidivism even when controlling for other theoretical explanations. More recently, a meta-analysis conducted by Pratt, Cullen, Sellers, Winfree, Madensen, Daigle, Fearn, and Gau (2010) found support for each of the four primary components of social learning theory. Specifically, Pratt et al. (2010) found strong support for differential association with .225 effect size, .218 for antisocial definitions, .097 for differential reinforcement, and .103 for imitation.

**Labeling Theory.** Similar to the other schools of crime theories, labeling theory suggests that offenders sentenced to prison for longer periods of time will recidivate at a higher rate than those given a lesser sentence. In the early 1900s the criminal justice system began to change its perspective on crime, especially juvenile crime. Progressives began to question the effectiveness of sentencing youth to adult correctional penitentiaries, suggesting that the environment may explain crime more than the character of the individual (Rothman, 1980).
Expanding on the perspective that crime may not reside with the individual offender, Tannenbaum (1938) proposed that modern day criminologists were focused on the wrong aspects of crime. Instead of focusing on the shortcomings of the individual offender, Tannenbaum argued that as youth receive punishment from the juvenile justice system, they begin to perceive themselves as deviant. The more the label “delinquent” is applied by the community, the more prosocial alternatives are closed for the youth. In turn, the youth begins to adopt the label of delinquent—resulting in a transformation from non-delinquent to delinquent self-image. As the youth adopts this new image, he or she will tend to gravitate to those people who are accepting of this new image. Once a youth is attached to others that support this new image, the youth is then reinforced for being delinquent and begins to solidify his or her image that they are delinquent.

Building on Tannenbaum, Lemert (1951) highlighted the differences between primary and secondary forms of deviance. Critics of Tannenbaum suggested that his view of crime was too simplistic and that it did not provide a general understanding of why crime occurred in the first place (Goode, 1975). Lemert attempted to address the shortcomings of Tannenbaum's original discussion by separating primary from secondary forms of deviance. Primary forms of deviance were defined as initial behavior that was against societal norms, while secondary forms of delinquency were a product of society's response to the initial criminal behavior. More specifically, Lemert (1967) posited that only under certain conditions will secondary deviance occur. First, the youth must engage in deviant behavior (meets the condition of primary deviance). Second, society must respond to the delinquent behavior with social penalties. These penalties can occur officially or unofficially, but must be felt by the individual. Third, the adolescent must engage in similar behavior again and society's response is increased. The
sanctions are greater and the individual begins to experience rejection from conventional others. Upon feeling rejected the youth then engages in further deviance with some feelings of revenge towards those persecuting him or her. Once the juvenile engages in this level of behavior, Lemert suggested that the community will respond through official avenues instead of informal social control. Members of society will officially shun the adolescent by applying labels like delinquent, offender, or deviant and subsequently the youth will adopt a similar view of him or herself.

Becker (1963), expanding on Tannenbaum and Lemert, moved labeling theory into mainstream criminology. At a time when society was adopting anti-establishment views, Becker pointed to the application of labels as a means for those in the majority to keep "outsiders" at bay. He argued that advantaged social and political groups would develop laws and conventions that ensured that the labels be applied differentially for specific groups. Moreover, he stated that persons who are more deviant are more likely to apply the label to them and adopt a counterculture that reinforces the labeled behavior.

Similar to Lemert, Becker offered three steps to how labels were applied. First, individuals must engage in primary deviance, second, the deviance must be discovered, and third the behavior must be labeled by a person of authority. Becker did not provide a strong explanation of why people initially engaged in deviance, just that once people were labeled deviant, they were more likely to adopt that label and ultimately begin to perceive themselves as criminal. Adopting a deviant label can be characterized as similar to prosocial people defining themselves by their career or as a parent. These labels, applied to the core view of oneself, can limit the access to future prosocial choices.
Once self-identified as a deviant, Becker (1963) argued that some of these labeled persons would seek out a counterculture group that supports the individual's deviant behavior. Within this subgroup, the individual would receive recognition and support for continued efforts in the deviant behavior. These expanded connections would actually increase the likelihood and frequency of the deviant behavior, ensuring that the individual would continue to engage in the deviant behavior. For example, a youth may have a difficult time controlling his or her temper at school. He or she may get in a few fights and be identified by the administration as a bully, receiving an in-school suspension as a result of the fight. At this point the youth has a choice. He or she can acknowledge that the behavior is not acceptable and subsequently discontinue the fighting or the student can continue to see the benefit in fighting and maintain this deviant behavior. If he or she maintains the deviant behavior and starts to identify with the label "bully," the youth is more likely to seek out others who bully and begin associating with these youth. These new friends of the youth will become a reference group for the youth and he will no longer see himself as being an outcast of society, but that he and is his new companions are being persecuted by those in charge, which subsequently reinforces the youth's deviant behavior.

Similarly, labeling theorists would argue that once the labeling process begins, an individual can start to shape their own behavior by viewing themselves as delinquent. Usually referred to as self-fulfilling prophecy, Merton (1948) defined it as “a false definition of the situation evoking a new behavior which makes the originally false conception come true” (p. 195). Applied to crime, the individual is first labeled a delinquent by the system—even though the youth is no different than other similarly aged youth. Even though at the time of the label the youth was not delinquent, the youth begins to believe the label to be true. He or she starts to
make decisions based on this reference point—in doing so, begins to “validate” the underlying label.

Once dismissed as not having much empirical support, labeling theory has a growing literature that suggests that being tagged a criminal, more specifically an ex-con, associates the individual with dangerous offenders, making it difficult to be accepted back into society (Jonson, 2010). Formerly incarcerated individuals face significant barriers to obtaining housing, sustainable employment, and even basic rights like voting (Pinard & Thompson, 2006). These barriers do not just offer a tougher road to recovery, but truly inhibit offenders from reintegrating back to society. For example, Manza and Uggen (2006) found that offenders who lose the right to vote are also less likely to adopt conventional lifestyles, feeling “left out” of society, and are more likely to engage in future crimes.

Apel and Sweeten (2010) found that offenders who went to prison were less likely to engage in employment than those that were also convicted of a felony but remained in the community. Using an experimental audit design, Pager (2003) examined the impact that a criminal record had on the likelihood of a person engaging in criminal behavior. While not specifically examining exposure to prison, it can be assumed that employers would be no more likely to hire previously incarcerated people. Specifically, he matched two pairs of applicants based on social history, physical characteristics, and social skills. He then alternated on a weekly basis, the pair’s criminal history controlling for any unmeasured characteristics of the applicants. Interestingly, he found that applicants with a criminal history were significantly less likely to be hired than similarly situated applicants that did not present with a criminal history. Although this was not always the case, there were some employers who preferred to hire applicants with criminal history, the majority of employers preferred to hire non-criminal applicants. Although
there are several competing hypotheses of why this might occur, one explanation is that offenders who go to prison believe that the social stigma associated with prison is so strong that the offender does not apply for jobs, assuming that they will not get hired. Although once considered irrelevant, labeling theory is starting to gain some traction as offenders are finding it difficult to reintegrate back into society upon release (Petersilia and Iovanni, 1989).

**Age-Graded Social Bonds.** Similar to social learning and labeling theories, social control theorists argue that involvement in the criminal justice system, specifically being sentenced to prison will increase future criminality. Unlike social learning and labeling theories which explain why people engage in more crime, age-graded social bonds explain why people do not engage in crime. Assuming that people are hedonistic, Hirschi (1969) developed social bond theory to explain how people resisted crime. Ultimately, Hirschi (1969) argued that as youth developed ties to social institutions (e.g., school), attached or formed close bonds with others, become involved in conventional activities, and adopted societal rules, they were less likely to engage in future delinquency. On the contrary, if the social bonds of adolescents were disrupted (e.g., the youth was placed in a custodial setting), then those individuals would be less likely to have stakes in conformity, explaining their willingness to engage in future criminal behavior. Laub and Sampson (1993: 304) suggested that the development of these social bonds was not static, but instead a dynamic process in which the offender can regain his or her “connectedness” to society through developing a quality marriage or stable employment. For Sampson and Laub (1993), the idea of the “connectedness” or the quality of the bonds was more important than the timing of the event. More specifically, they argued that incarceration would not have a direct impact on future criminality but would have a significant negative impact on job stability and the quality of marriage, both of which are directly correlated with recidivism.
Sampson and Laub (1993) tested age-graded social bonds theory by using a sample previously studied by Glueck and Glueck (1950). They found that early disruptions in social bonds were mitigated by the quality of bonds later in life. More specifically, being incarcerated as a youth did not have a direct effect on future criminality; but instead, being placed in a custodial setting had an indirect effect by impacting the quality of future connections to work and marriage. Expanding on the original test of age-graded social bonds, Doherty (2005) found that offenders who entered into strong bonds were less likely to engage in future criminality while controlling for the individual’s prison experience and risk level. Specifically, Doherty (2005) found that persons who reported having stronger social bonds during their early 20s were 15 percent less likely to reoffend over the course of the next 20+ years regardless of their connectedness to social bonds as an adolescent. Moreover, she found that there was a direct reduction in the rate of offending as the number and quality of connections increased, suggesting that the more social bonds an offender has in their life the faster the offender desists in crime and that the effects of incarceration are mitigated by the quality of connections made post-incarceration. Ultimately, age-graded social bonds suggest that even if prisons can show a short-term impact on crime, the unintended consequences of disrupting potential social bonds may have longer lasting effects on increasing recidivism than prison itself.

**General Strain Theory.** According to strain theory, obtaining the American dream is a universal goal, which is thus shared by all in the United States—even those engaged in crime. Based on the works of Merton (1968) and others (Agnew, 1985; Cohen, 1955; Cloward & Ohlin, 1960), general strain theory suggests that people engage in criminal behavior because they have experienced cultural or institutional barriers in reaching positive goals—the American dream. Merton (1968) originally proposed that some people become frustrated with their inability to
advance through legitimate means so they turned to criminal behavior. Whether someone who was frustrated would turn to crime depended on the individual’s belief that he or she could still reach the American dream and still had faith that success was obtainable through legitimate conventional means.

Recognizing that most people blocked from the American dream continued to conform to society’s norms, Merton (1968) developed a typology for those that did not choose conformity. The first category within the typology is innovation, which is used to describe those that use illegitimate means to meet the goal of economic advancement. Merton contended that most criminal behavior can be explained through innovation. That is, offenders believe the ends justify the means, perceiving that crime is the only way that they can obtain the American dream. The second category defined by Merton was ritualism. Unlike innovators who find illegitimate ways to meet the American dream, ritualists settle on a diluted version to manage strain. In scaling down the goal, they can continue to maintain conformity but do not aspire for greater success. In contrast, retreatists see the American dream as unobtainable and therefore opt out. For them, escape is the only solution. Some escape through altering their state of mind (e.g., drug use), while others remove themselves completely from the process (e.g., homeless, suicide) (Lilly, Cullen, & Ball, 2010). The fourth category defined by Merton was rebellion. Those who chose rebellion are interested in changing the goal versus conforming to it. The only solution the rebellious see is to reject the American dream and replace it with a different set of goals that assume a different set of means.

Although Merton’s version became the foundation for future general strain theories, most suggested that Merton’s explanation was limited in its ability to explain criminal behavior (Burton and Cullen, 1992). Instead of limiting the source of strain to the blockage of goals
alone, Agnew (1992) argued that strain can also be caused by removing positive stimuli or receiving negative stimuli. Removing positive stimuli, or taking away something a person likes, can be a major source of strain. For example, parents grounding their teenage child from attending the prom can subsequently cause strain, and potentially lead to their child sneaking away to attend prom or, even worse, engaging in a physical altercation with his or her parents. In this situation, the teenager feels strain and subsequently a negative emotion such as frustration and anger. As a result, the teen may become innovative (sneaks out the window) or rebellious (engages in violence to change the outcome).

Beyond adding two additional situations in which individuals feel strain, Agnew built upon Cloward and Ohlin’s (1960) work regarding what conditions mitigate strain, so as to not cause criminal behavior. Where Cloward and Ohlin focused on blocked access to legitimate means, Agnew (1992) expanded this concept by identifying that the effects of strain are mitigated by many variables including the ability of the individual to cope with stress, the availability of alternative goals, the presence of a strong social support network, and the fear of punishment.

In addition to identifying the variables that might mitigate the impact of strain on an individual, Agnew (2001) also attempted to explain which types of strain would lead to crime. First, he posited that people who interpreted strain as unfair will feel angry and that anger will lead to criminal activity. For example, a person who was fired unfairly from a job might become really angry and engage in retaliatory violence. Second, Agnew argued there were varying degrees of strain and that those of which were the strongest would lead to crime. Third, individuals who do not have strong social supports are more likely to engage in criminal
behavior. And fourth, if crime has significant advantages over a non-criminal response in reducing strain, individuals were more likely to engage in crime.

As general strain theory can explain why people engage in criminal behavior, it can also be used to explain why prisons could make offenders worse. First, prisons block inmates from achieving the American dream. As noted previously, offenders who are incarcerated have more difficulty obtaining housing, getting basic needs met, and maintaining employment; all of which are necessities in reaching upward mobility. Second, prison is a negative stimulus for most offenders. That is, prison life is harsh and amenities are sparse causing strain for inmates. Third, inmates often see their incarceration as unjust (see Andrews and Bonta, 1990). Fourth, the amount of problems inmates face could be associated with higher magnitude of strain. As the combined effects of prison on strain are explored, it is understandable why prisons might cause higher rates of recidivism. Blevins et al. (2010) have realigned what has been historically identified as competing explanations of prison violence (deprivation model, importation model, and coping model) with Agnew’s general strain theory. Blevins et al. (2010) posit that general strain theory encompasses these models and explains how each of these has an impact on the individual’s response to prison through an understanding of strain. For example, those that apply an importation model have a difficult time explaining why a non-violent offender would be violent in prison. Deprivation models can explain this, but have a difficult time explaining why all inmates do not adopt the cultures and mores of the prison. Combining all three competing models under general strain theory begins to create a framework to understand why some prisoners engage in misconducts and subsequently reoffend at higher rates post-release.

Recently, Listwan et al. (2013) have applied general strain theory to explain the impact of prison on recidivism. Specifically, they studied how victimization, perceptions of danger, and
hostile relationships with correctional workers had an impact on recidivism. Controlling for offender risk, Listwan et al. (2013) found that being housed in a negative prison environment resulted in significantly higher recidivism rates even if the inmate did not directly experience victimization—just living in an environment that was perceived as hostile resulted in higher recidivism rates.

**Prisons Have No Effect**

The third perspective regarding the effects of prison is that it makes offenders neither better nor worse. Instead, it is proposed that prisons are “psychological deep freezes” in which offenders remain virtually unchanged throughout their prison experience (Zamble & Porporino, 1988). Bolton, Smith, Heskin, and Banister (1976) challenged the existing theory that inmates are likely to deteriorate psychologically over time. In studying a cohort of inmates and comparing them to non-prisoners, they found no evidence that inmates experienced a deterioration of well-being, and in fact, they found the opposite—over time inmates experienced an increase in emotional maturity. Expanding on Bolton and colleagues work, Zamble (1992) studied the impact of incarceration on long-term prison inmates using a longitudinal design. He found that inmates began to adapt to their surroundings—resulting in fewer disciplinary incidents, reduced stress-related medical problems, and decreased periods of dysphoric emotional states. While Zamble found that inmates changed to function better in the prison environment, Toch (1975) suggests that inmates find ways to get their needs met within the existing system by either manipulating their environment or the rules so as to protect themselves. Cobden and Stewart (1984) found that long-term inmates were more likely to find ways to blend in to the daily routines, almost becoming invisible to the other inmates by engaging in the daily routines of the prison.
**Importation Theory.** As suggested by Irwin and Cressey (1962) in their “importation theory,” offenders sentenced to prison bring with them a set of values and beliefs that define how they will adapt to prison life and beyond. More specifically, Irwin and Cressey (1962) suggested that inmates can be organized within three subcultures. The first, thieves’ subculture describes inmates who live by a criminal code—career criminals who see crime as a profession. These inmates typically behave well in prison, adapting quickly to the rules of the prison, but upon release return to a criminal lifestyle. Prison does not impact how they see themselves but instead is seen as a consequence of the lifestyle. The second, the convicts’ subculture, is comprised of offenders who find themselves in prison often. These are offenders who engage in a range of criminal acts and use their knowledge and skills to benefit them in prison. For convicts, prison is not seen as a punishment, but as a place to continue engaging in manipulative and self-serving behavior. The third subculture, the legitimacy subculture describes inmates who are relatively prosocial and do not ascribe to a criminal subculture. There is a common factor across all three subcultures suggested by Irwin and Cressey; offenders who are sentenced to prison leave prison with similar risk factors as they entered.

As cited in the previous sections, there are a series of meta-analyses conducted over the past 20 years on the effects of prisons—with most finding that prisons have no marked effects on future recidivism. Gendreau et al. (2000) found that offenders who received non-custodial interventions reoffended at similar rates to those who received prison, supporting the concept that prison has no effects. Following up on the Gendreau et al. meta-analysis, Smith et al. (2002) found that prisons do not have any greater impact on recidivism than non-custodial interventions, nor does sentencing offenders to longer stays. Nagin et al. (2009) found similar results, suggesting that prisons have minimal impact on future recidivism. In contrast, Jonson (2010)
found that under most circumstances prison increased recidivism. Although these findings point to mixed results, it is evident that under many conditions prisons do not have a significant impact on behavior for the better or worse, but at best, remove offenders from society for a given period of time.

**Prisons Have Varied Effects**

Based on the previous sections, it is difficult to discern the effects of prison on recidivism. Most studies find that prison has either no effect or a slight criminogenic effect, while a limited number of studies have found that prison decreases recidivism. Although the mixed results could be explained by several factors—non-equivalent control groups, ecological fallacy, participation in programming, sample specific characteristics, inability to control for risk—the differences could also be explained by differential effects based on specific responsivity factors. Although typically applied to treatment settings, specific responsivity can also assist in explaining the differences in the impact of prison on inmates. Specific responsivity “calls for treatment interventions to consider personal strengths and socio-biological-personality factors” (Bonta & Andrews, 2006: 7). Applied to prison, it could be argued that an offender’s personal characteristics could differentiate the effects of prison. Specifically, previous research has examined the impact of prisons on gender, race, age, and risk. In addition to individual characteristics, there is a growing literature on the effectiveness of correctional treatment interventions. This section will examine the literature regarding the impact that correctional treatment has demonstrated on reducing recidivism, as well as the ways in which gender, race, age, and risk can influence prison’s effects.

**Correctional Treatment Services.** Institutional-based treatment services suffer from the same fate that the broader correctional programs did in Martinson’s ballot box review; some
institutional treatment programs have demonstrated a positive effect in reducing recidivism, while others have had the opposite effect—resulting in no reductions or worse increased recidivism (Andrews & Bonta, 2010; Andrews, Zinger, Hoge, Bonta, Gendreau, & Cullen, 1990; Cullen & Gendreau, 2000; Gendreau, 1996; Gendreau, Little, & Goggin, 1996; Martinson, 1974). For institutional programs to be effective, Andrews and Bonta (2010) set forth three guiding principles for programs to follow. First, programs should use cognitive-behavioral treatment strategies. These strategies focus on addressing cognitive distortions, modeling appropriate ways to handle situations, and teaching new skills to offenders. Second, programs should address criminogenic needs—those dynamic factors that predict recidivism (e.g., criminal attitudes, substance abuse, employment). Third treatment should be reserved for higher risk offenders. In contrast, programs that use non-directive techniques (client focused), focus on non-criminogenic needs, and target lower risk offenders will fail in producing marked reductions in recidivism (Andrews & Bonta, 2010).

Programs that adhere to the above principles have been found to have greater reductions in recidivism (Andrews et al., 1990; Andrews, Dowden & Gendreau, 1999; Andrews & Bonta, 2003; for a review see Gendreau, Goggin, French & Smith, 2006). Institution-based programs that follow these principles have demonstrated 20 percent reductions in recidivism; while programs that violate the principles tend to have little effect on recidivism or sometimes increase recidivism rates slightly (Andrews et al., 1990; Andrews et al., 1999). Although it is evident that correctional treatment can reduce recidivism, it is not clear how often programs found in the field adhere to the principles of effective treatment. Martinson’s (1974) original assertion that “nothing works” was based on a ballot box method in which slightly more than 50 percent of the programs reviewed ranged from no reduction to an increase in recidivism. Lab and Whitehead...
(1990) agreed, suggesting that a majority of programs associated with high reductions in recidivism were specialized programs that were delivered in conjunction with external oversights, and that it was not common to find programs following the principles of effective treatment. In fact, the University of Cincinnati Corrections Institute has found that 75 percent of the programs assessed on the Correctional Program Assessment Inventory (CPAI) and the evidence-based Correctional Program Checklist (CPC) were in the ineffective or needs improvement categories (UCCI, 2010).

Even following the principles of effective treatment may not be enough without maintaining fidelity to the model. In a study examining the implementation of Functional Family Therapy (FFT) and Aggression Replacement Training (ART), Barnoski (2004) found a 54 percent difference in recidivism rates for FFT when delivered with fidelity compared to programs that do not follow the model. Moreover, ART programs delivered with high fidelity demonstrated 24 percent reductions in recidivism, while programs that did not maintain fidelity increased recidivism by 10 percent. Even though there have been significant discrepancies in the effects of programs in reducing recidivism, Lipsey (1999) found that even programs which did not maintain a high degree of fidelity to the principles demonstrated a 3 percent reduction in recidivism. These findings suggest that treatment may mitigate the impact that prison has on inmates—thus, offering effective programs for inmates may shift the prison environment from having little impact on recidivism to having a positive effect.

**Effects of Prison by Gender.** Historically, the impact of prison on women has been ignored by mainstream criminologists—assuming that women experience the same issues as do men (Daly & Chesney-Lind, 1988). Since 1980, the number of women incarcerated in state prisons has increased by 900 percent (Sabol & Couture, 2008). The war on drugs and “get
“tough” policies designed to target violent crime has had a significant impact on the number of women incarcerated (Bloom, Chesney-Lind, & Owen, 1994; Merlo & Pollock, 1995). It is reported that women have significantly different needs while in prison then men. Women in prison present with significant barriers to education and employment, have higher rates of substance abuse, experienced severe histories of sexual and physical abuse, and tend to have a greater frequency of mental illness than their male counterparts. Based on these differences, it is argued that women experience prison differently than men. Yet, few empirical studies have been conducted to determine the impact that prison has on recidivism specific to women.

Why would the impact of prison be different for women than men? One argument is that women place greater emphasis on connections to family members and friends in the community and that prison significantly disrupts these connections (Dowden & Andrews, 1999; Hairston, 2003; Petersilia, 2003; Van Voorhis, Salisbury, Wright, & Bauman, 2008). Exacerbated by the fact that there are significantly fewer female facilities, increasing the distance families must travel, female inmates experience significant difficulties in maintaining these connections while incarcerated (Bloom & Steinhart, 1993; Covington, 1999). Moreover, Bloom and Steinhart (1993) suggests that separating women from their children is one of the most harmful aspects of incarcerating women.

A second argument for why prisons would have a differential effect for women is driven by the higher rates of sexual and physical abuse histories. Covington and Bloom (2003) suggest that women who have experienced past abuse (e.g., diagnosed with post-traumatic stress disorder) are re-traumatized by the general practices regarding safety and security of a prison (e.g., strip searches, isolation). Specifically, these practices trigger memories of past abuses and
increase the likelihood that women’s experience in prison exacerbates the issues that females face upon reentry.

A third argument for why prison may have a differential effect from women is that women experience significantly more barriers to returning to society than men. Brown, Melchior, and Huba (1999) suggest that women are more likely to face significant burdens in obtaining housing and employment because they are more often responsible for the needs of their children in addition to their own. Covington (2002) posited that services for women are often disconnected and that service coordination is minimal, resulting often in conflicting expectations.

In a meta-analytic review, Smith et al. (2002) examined the impact that prison had on recidivism for females. Although the results were limited due to small effect size (k=10), they found no differential effects for women who were sanctioned to prison or spent longer time incarcerated than men. Specifically, females who spent longer time incarcerated experienced slightly higher effect sizes than males, but the confidence intervals overlapped suggesting that there were no significant differences. Smith et al. (2002) also examined the impact that prison had on recidivism compared to community supervision. Again limited by small effect size (k=1), they found that there were no differences between males and females.

Further examining the effects of prison on females, Jonson (2010) found little evidence that prison has a greater impact on recidivism for women. Although there were no studies that examined women exclusively, there were 15 studies that examined the impact of custodial placements on a mixed population. For a mixed population, she found that the confidence intervals for males overlapped with the mixed sample suggesting no significant difference between all males and studies with a minimum of 20 percent females. Moreover, when Jonson (2010) examined the effects of shorter versus longer periods of incarceration there were not
enough studies that examined the impact on just females (k=2), but for studies that examined a
mixed population, the confidence intervals overlapped with all males once again.¹

**Effects of Prison by Race.** Although people of color represent over 50 percent of the
prison population in the United States, very few studies have been conducted examining the
differential effects of prison on recidivism by race (Sabo & Couture, 2008). Similar to gender, it
is suggested that incarceration may have differential effects based on race. Pettit and Western
(2004) suggest that incarcerating people of color disrupts an already tenuous path into
conventional lifestyles causing even greater disadvantages for young black males than any other
racial group—leading to an interaction effect between race and incarceration. For example, the
United States Office of Employment and Unemployment Statistics (2010) reported that the ratio
of employed black males to the population was 58.2 percent in 2009 compared to 68.7 for white
males and 72.2 for Asian males. In addition to higher unemployment rates for black males, there
are also higher unemployment rates for ex-offenders. Holzer, Raphael, and Stoll (2004) found
that employers were less likely to hire someone recently released from prison or someone who
had committed a serious felony compared to those without a criminal record. Since black males
experience significantly higher rates of incarceration than white males, and those who were
formerly incarcerated face significant barriers to employment, it is suggested that the impact of
incarceration is significantly more detrimental for black males (Raphael, 2007). Gould (1969)

¹ Although it is suggested that there were no significant differences between the effects of prison on men
and women these results should be interpreted with caution. As Snook, Eastwood, Gendreau, Goggin, and Cullen
(2007) suggest, confidence intervals around mean effect size should be considered imprecise when larger than .10.
For both of these meta-analyses the confidence intervals were larger than .10 and therefore, should be interpreted as
imprecise measures of the effect of prison on women.
offers a further explanation of the impact of higher incarceration on minorities. He suggests that
prison has become so common in the African-American culture that it no longer poses a
stigmatizing label, but instead is almost seen as a rite of passage.

**Effects of Prison by Risk.** The risk principle has been extensively researched within
community samples, but less with prison populations. Overall, the risk principle suggests that
more intensive interventions should be reserved for higher risk offenders and in contrast, higher
intensive interventions may potentially have an iatrogenic effect for lower risk offenders
(Andrews, Bonta, and Hoge, 1990). For example, Lowenkamp and Latessa (2002) found that
higher risk offenders placed in a halfway house or community-based correctional facility
(CBCF) experienced 8 percent reduction in recidivism compared to those who received
community supervision. Comparatively, lower risk offenders experienced an 8 percent increase
in recidivism if placed in a halfway house or CBCF. As for the impact of the risk principle on a
prison population, the research is not as robust. Smith et al. (2002) reviewed the impact of
prison based on the level of offender risk. Overall, they found no significant differences in the
effects of prison based on risk. In addition to the overall effects of prison, they examined the
impact of longer sentences on lower risk offenders. While they found longer sentences resulted
in slightly higher recidivism rates, there were no differences in recidivism between low and high
risk offenders. One significant limitation to Smith et al.’s findings should be noted regarding the
impact of the risk principle; although meta-analysis is a useful tool it cannot overcome
deficiencies in the primary studies. Smith and colleagues noted that the original studies did not
provide adequate measures of risk and suggest that future studies should focus on more precise
measures of risk.
As for the effect of custodial placements on juveniles, the research is even more contradictory. While the evidence supporting the use of prison to reduce recidivism is limited to a few studies, the studies demonstrating no effect or increased recidivism are limited as well. Haapanen, Britton, and Crosidale (2007) used a sample of youth released from the California Youth Authority (CYA) to study the impact of severe sanctions, more specifically incarceration, on future delinquency. First, the authors found that arrest rates for youth committed to CYA were escalating just prior to incarceration and reduced significantly upon release, suggesting that prison had a significant impact on the trajectory of the youths’ offending patterns. Second, the authors found support for longer sentences, positing that holding youth past their 21st birthday resulted in significantly fewer subsequent arrests than if released at 18. Comparatively, Loughran, Mulvey, Schubert, Fagan, Piquero, and Losoya (2009) used propensity scores to match youth who were placed on probation to those placed in custody. They found that youth placed on probation were re-arrested at a slightly lower rate than those placed in custody, suggesting that placing youth in prison has no marked effect on recidivism. Furthermore, Loughran et al. (2009) examined the effects that longer stays in prison had on future recidivism. Similar to the previous study, they used propensity scores to control for any individual characteristics that would explain the differences in longer stays (i.e., risk of the offender). Based on the results of the analyses, Loughran et al. (2009) found no significant differences in recidivism for youth who served between 3 and 13 months. For youth who served less than 3 months and more than 13 months, the results suggested that length of stay may have some

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2 The authors used a stratification process to match offenders by propensity scores.
impact on recidivism, but these results are considered by the authors to be questionable due to the limitations of the data—mainly significantly shorter follow-up time for those offenders who served longer periods of incarceration.

Winokur et al. (2008) followed 16,779 youth released from post-adjudication programming over a two year period to determine if the youth’s length of stay had a substantive effect on new adjudications. Overall, there was no significant correlation between length of stay and recidivism. While they did not control for the risk of the youth, they did look at the level of facility (non-residential, low risk, moderate risk, and high risk) and controlled for some legal variables including offense level. Winokur et al. (2008) found that youth housed in the high risk facilities did better if released before three months or stayed between thirteen and twenty months. For those youth in nonresidential, low risk and moderate risk custody length of stay was not predictive of new adjudications, suggesting that longer exposures to these settings had no effect.

Limitations of the Extant Research

While there are a few studies that have examined the impact of length of stay on recidivism for youth, these studies have methodological limitations that make it difficult to generalize the findings. For example, the study by Haapanen and colleagues (2007) and Winokur (2008) did not control for risk at the individual level. While state facilities generally receive higher risk youth, risk is a significant confounding variable that could ultimately explain differential recidivism rates between short and long term stays. Specifically, Haapanen et al. (2007) examined 30,229 youth committed to the California Youth Authority but did not control for risk when examining the outcomes. Assuming that youth incarcerated in California have varying degrees of risk, their results may be significantly different when controlling for risk. As
for Winokur et al (2008), they also did not control for risk on the individual level but instead examined the impact that length of stay had by the facility level—which was used as a proxy for youth risk. Several of the current studies have developed post-hoc measures of risk (i.e., criminal history), while others have used newer techniques including propensity matching, but it is rare to have risk assessment information prior to custody.

Another confounding variable that has not been taken into account is the variation in length of stay. For example, Gottfredson and Barton (1993) used a sample of youthful offenders that varied in length of stay by only 4 months. Even though they did not find significant differences it could be argued that the range in length of stay was limited, therefore minimizing the effects. Since the time juveniles have to serve is relatively truncated due to age limits, prior research has had a difficult time establishing enough variation to determine if the length of sentence had an effect.

A third limitation in the current research is the lack of a uniform measure of recidivism. Some studies have used self-report data (see Loughran et al., 2009) to measure recidivism while others have used re-arrest or re-incarceration (see Haapanen, 1990). Fourth, selection bias is a significant problem in examining the impact of prison on youths. Specifically, youths who commit more serious offenses typically get confined and once confined receive longer sentences; therefore, most research has had limited ability to address selection bias (see Murray & Cox, 1979). Finally, examining the effects of residential treatment is hampered by differential attrition. Differential attrition is the process in which lower risk youths complete treatment early; therefore, are released while higher risk (or typically more serious offenders) are maintained at the facility for longer periods of time. This can pose a significant problem in understanding the differential impact of prison on individuals if the short and long-term cohorts
are heterogeneous. These limitations have made it difficult to interpret the results of previous studies and at times may explain some of the inconsistencies in the findings. The next chapter will describe the methods used in this study and will address the limitations of many of the previous studies that have examined the effects of longer stays on future criminality.

Summary

Over the past 50 years, the juvenile justice system has experienced significant changes. While most of these changes have significantly impacted the capacity of the juvenile justice system to deliver rehabilitative services very little is known as to the impact of these changes, especially on youth who are being housed in custodial settings. Moreover, there are four schools of thought that suggest that longer custodial settings could potentially make kids worse or make kids better, have no impact on recidivism or have some effects depending on the type of youth being housed. Ultimately, knowing the impact that length of stay has on future recidivism will provide better guidance to those professionals responsible for making custody decisions. The next chapter will set forth the research hypothesis, discuss how the limitations of previous research will be addressed, and the methods that will be used to test this hypothesis.
CHAPTER 3: METHODS

Introduction

While the juvenile justice system was originally charged with rehabilitating wayward youth, it has been transformed over the past 40 years to consider a broader array of goals including public safety, restorative justice, and retribution for youth (Zimring, 1998). Under the original goal of rehabilitation, the juvenile justice system had one mission—help youth get better. Since taking on a broader array of goals, it is often difficult to determine if the juvenile justice system has been successful in meeting these goals. Regardless of the goal, it is important to understand the impact that longer stays in custody have on young people so juvenile justice personnel can make informed decisions regarding future policies impacting length of stay.

The purpose of this dissertation is to provide a clearer understanding of the impact of length of stay in a custodial setting on future recidivism. While this dissertation will not directly test the aforementioned theories, it will contribute to an exploration of the broader schools of thought regarding the impact of length of stay on youths. Additionally, it will provide insight into policy implications as well as set forth a research agenda for future studies. Specifically, this dissertation will test the following hypothesis:

The length of stay of youths in juvenile correctional facilities is associated with future recidivism.

In addition, this research will investigate how any relationship between length of stay and recidivism may be conditioned by the race, age, risk, and gender of the youths.
Hypothesis

*Hypothesis: The length of stay for youths in juvenile correctional facilities is associated with future recidivism.*

As discussed previously, there is minimal research on the effects of longer exposure to custodial stays for juvenile delinquents and what research that is available has several limitations. This dissertation sets forth to systematically address those limitations so as to provide greater insight for policy makers on the effects of longer stays. To meet this, the first question that must be answered is what effect does length of stay have on future recidivism. Given the four schools of thought, it could be expected that longer stays will be associated with higher recidivism rates or lower recidivism rates, have no effect on future criminal or delinquent behavior, or have mixed results depending on the characteristics of the youth. The initial step to answer this question was to examine the relationship between length of stay and recidivism, controlling for no other variables. The second step to address the limitations of previous research was to control for variables that impact either length of stay or future recidivism. These variables included individual level characteristics like mental health, substance abuse, gender, race, and age as well as time at risk and risk to reoffend. Based on the results, the next step was to explore if the association between length of stay and recidivism was conditioned by race, gender, age, or risk. Once the relationship between length of stay and recidivism was fully explored, the results were converted into predicted probabilities to provide a clear picture as to the effects of length of stay on future recidivism.
Description of the Ohio Juvenile Justice System

Ohio officially adopted a separate court for juveniles in 1906\(^3\). The Ohio juvenile court system remained relatively unchanged until the 1960’s when the Supreme Court determined that juveniles should be afforded similar rights to those of adults. This was interpreted by many as the first step in "adultifying" the juvenile system (Fagan, 2008). Like most states, Ohio's juvenile justice system was designed to serve in the best interest of the youth. To accomplish this, the court was granted a broad range of discretion to address delinquent behavior. This decision by the United States Supreme Court initiated the first of many reforms to the juvenile court. During the 1970s and 1980s, Ohio, like many states, began to explore tougher sentencing options for juvenile delinquents. In 1981, Ohio passed legislation that moved towards tougher penalties for juvenile offenders while trying to protect lower level, juvenile delinquents and status offenders. Prior to this legislation, youth that were committed to the Department of Youth Services (DYS) had to stay a minimum of 30 days for an evaluation period. Once the evaluation was completed, DYS could release that youth back to the community on parole immediately. Based on this new legislation, DYS no longer had the ability to release the youth until their mandatory minimum sentence was served. This change included provisions that youth who have committed a felony and placed at DYS were to spend a minimum of 6 or 12 months (depending on the severity of the offense), while misdemeanants and status offenders were precluded from state commitments. In addition, the new law made it impossible for DYS to release a youth prior to his or her minimum sentence. Instead, the bill included a provision that the committing judge was the only person who has the capacity to release a youth prior to his or her mandatory

\(^3\) Although Ohio did not officially establish a juvenile court until 1906, Cuyahoga County began serving juveniles separately in 1902.
minimum. If the youth was granted early release prior to his or her midpoint (half of the minimum sentence), the youth would be released back to the local jurisdiction and placed on probation. If the court released the youth beyond the midpoint but prior to the minimum, the youth was released on parole (Senate Bill, 1989).

In 2002, Ohio legislation was passed that redefined the mission of DYS. Previously tasked with a mission to provide care, protection, and mental/physical development of children committed to DYS, the new mission was designed to address a broad range of targets (the order of importance was also detailed in the legislation (Giannelli & Salvador, 2009))

1. Protect the public interest and safety
2. Hold offenders accountable
3. Restore victims
4. Rehabilitate offenders
5. Provide for the care, protection, and mental/physical development of children

As noted, while the original goal to rehabilitate and provide care to the youth in custody was the only goal directly expressed in DYS’ mission, the new legislation not only identifies several other goals, it places the emphasis on addressing public safety, accountability, and the restoration of victims over the needs of the youth including providing effective treatment services. In addition to reprioritizing the system’s goals, Senate Bill 179 created the Serious Youthful Offender (SYO) category for delinquent offenders and gun/gang specifications. The Serious Youthful Offender category allowed for courts to identify “high risk” youth for a blended sentence, which splits the youth’s sentence across the juvenile and adult system. The gun and gang specifications permitted judges to place 1 to 5 year enhancements on a youth's disposition in order to ensure the public's safety (Giannelli & Salvador, 2009). While the
committing judge was permitted by statute to hold a hearing to determine if the adult portion of the sentence is enacted, the judge has no ability to release a youth while she or he is serving time for a gun or gang specification.

These changes in the system led to significantly different practices for DYS. First, the release of youth from DYS was contingent on a review process conducted by the Release Authority. The Release Authority was charged with reviewing all relevant information and making a determination if the youth was to be released from the facility or should be held longer. This decision was based on a collection of material including progress in the facility, behavior issues, response from the victim, and the court work group of the committing county. A study conducted by Travis, Latessa, and Lovins (2006), determined that a majority of youth were held longer than the expected release and that there were varying reasons for youth to be held past their expected release date, such as no appropriate placement options, disciplinary time, and lack of treatment completion.

Second, the treatment services available for youths were extremely limited. Other than for a few youth identified as having significant substance abuse issues and some sexual offenders, treatment services generally consisted of individual case management services and a few process oriented groups. While there was no official study conducted by DYS as to the amount of treatment services available, the available documentation suggested that youths received approximately 4 hours of treatment a month—resulting in approximately 50 hours of treatment for the average youth.
Third, while the conditions of the facilities varied across settings, there was a consistent lack of treatment opportunities and a pervasive culture of violence developing across all of the settings. In a summary report provided by SH v Stickrath (2004: 1), the plaintiffs claimed

A system-wide failure regarding conditions of confinement within facilities operated by DYS that endanger [youths] physical health and safety; threaten [youths] emotional and psychological well-being; deprive [youth] of adequate programming, education, medical and mental health care, and dental care; and deprive [youth] of due process of law.

At the time of this study, DYS operated eight juvenile facilities and had a contract with a private-not-for-profit facility. Seven of these facilities housed males, and two housed female delinquents. Of the nine facilities, five were designated for general population—Marion, Indian River, Cuyahoga Hills, Ohio River Valley, and Scioto. The four specialized facilities included Circleville, Mohican, Freedom Center, and Paint Creek. Youths were placed at one of the nine facilities based on several characteristics including security level, treatment need, program eligibility, and gender. To place a youth in one of these facilities, DYS had a centralized intake system operated at Scioto where all initial screening, assessments, and intake procedures were conducted. Once processed, females generally were initially placed at Scioto in their general population unit, while some were eventually transferred to Freedom Center. Freedom Center was an all-female facility that was located outside the secure perimeter of Scioto for girls who had significant substance abuse issues.

While the housing options for females were limited to Scioto or Freedom Center, there was a wider array of placement options for males. Once processed, DYS had five DYS operated facilities to place youth and one external placement operated by Lighthouse Youth Services. Each of the facilities was classified based on security level with Marion and Ohio River Valley housing primarily close and medium custody youth. Indian River and Cuyahoga Hills JCFs
housed medium and minimum custody youth respectively. Circleville housed all moderate and high risk sexual offenders, while Mohican was designed to address youth with high need substance abuse issues. While youth were placed initially based on these factors, it was common for youth to be moved on a regular basis between units within the same facility and across facilities for numerous reasons including discipline issues, space, and mental health needs. While the initial length of stay is set by the committing judge, a youth’s length of stay is ultimately determined by the Release Authority. While there are some circumstances where a judge can release a youth after their 6 or 12 month minimum, typically the only way a youth can be released from DYS once they have passed their minimum sentence is either through the Release Authority, turn 21 years of age, or be committed on a new offense to an adult facility. If the youth is released to the community prior to their 21st birthday, a term of at least 3 months on parole is mandatory. Ultimately, youth are discharged from parole by the Release Authority or age 21.

Data Collection

The data for this study were provided initially by the DYS for the purpose of investigating decisions made by the Release Authority. While these data were initially collected for other purposes, the richness of the dataset provided an opportunity to examine the relationship between length of stay, risk, gender, race, age, and re-incarceration. The data set provided by DYS included all youths who received a release decision between July 1, 2003 and June 30, 2006. There were 5,603 youths released from DYS during this period. While the

4 The de-identified data were provided by DYS for the purpose of the initial study and permission to use the data for the purpose of this dissertation was provided by the Deputy Director of Subsidy Grants.
original sample included both sexual and non-sexual offenders, this study focused specifically on those youths who were identified by the DYS as a non-sexual offender. There were three distinct reasons for eliminating the sexual offenders from the overall sample. First, the length of stay for sexual offenders was significantly longer than non-sexual offenders. Specifically, sexual offenders remained in the facility for an average of 22.3 months while non-sexual offenders stayed 10.2 months on average. Figure 1 provides a histogram of length of stay for sexual offenders and non-sexual offenders. As noted, there is minimal overlap in the two populations as related to length of stay. Examining the impact of length of stay on recidivism for the entire population would ultimately lead to an analysis of whether non-sexual offenders who stay shorter periods of time re-offend at different rates than sexual offenders who stay significantly longer. Second, sexual offenders generally have lower base rates of reoffending than non-sexual offenders (Quinsey, 1980). The current sample was no exception, in which sexual offenders were re-incarcerated at significantly lower rates (21.7 percent) than the non-sexual offenders (40.7 percent). Due to inherently longer stays and lower base rates of re-incarceration for sexual offenders, it would be extremely difficult to examine the impact that length of stay had on re-incarceration rates while combining these two distinct populations. Third, the variation on the length of stay for sexual offenders was significantly truncated due to mandated treatment. For these reasons, this study focused specifically on non-sexual offenders. The following section will provide a review of the variables that were included in this study.
Variables of Interest

**Dependent Variable.** This study will focus primarily on the relationship between length of stay and future criminal or delinquent behavior. While there are many ways to measure future criminal behavior, for the purpose of this study, recidivism was measured as re-incarceration within a 3 year post-release period to a juvenile or adult correctional facility for a new criminal offense. There are three reasons that incarceration for a new crime was selected for this study over arrest, conviction, or return for technical violations. First, the data for incarceration in the state of Ohio are more reliable than arrest or conviction. Arrest and conviction are measured at the county level and are not consistently reported across all 88 counties. Maltz (1984) posited that the most difficult part of measuring recidivism is ensuring that there is complete information on future criminal behavior. Using re-incarceration data decreases reporting error because all offenders that are re-incarcerated are tracked in a single data system. Second, 50 percent of the youths in this study were released prior to their 18th birthday. Since juvenile court records are not public record, it was not possible to acquire re-arrest or adjudication data. In contrast, the state of Ohio has an electronic data system that tracks youths’ entry into the juvenile and adult
correctional system. Although Blumstein and Cohen (1979) argue that Type I errors associated with arrest are less problematic than the more stringent measures of reconviction and re-incarceration, using re-incarceration for new crime ensures that there is no systematic error incorporated in reporting procedures across local jurisdictions. Third, this study is interested in examining the impact that length of stay had on increasing future delinquent or criminal acts. Like most systems, youths can return to the facility not due to delinquent behavior but due to violations of release conditions. While technical violations have an impact on who returns, this study is focused specifically on those youths who return for the commission of a new crime or a revocation for a new crime. In order to address those youths who were revoked for a technical violation only, the time associated with all stays, whether for the initial commitment or technical violation, was calculated and the follow-up period began upon final release from DYS.

**Independent/Control Variables.** To determine the impact of length of stay on youths placed in DYS, several variables of interest have been selected from those available. The following will provide a review of the independent and control variables selected for this study.

*Length of Stay.* The length of stay is the primary independent variable of interest for this dissertation. For the purpose of this study, length of stay is calculated by the total time each youth spent at DYS. The total time is cumulative for all custodial stays including revocation time served on technical violations. Previous research has used a range of measures for calculating length of stay. First, the number of days held in custody has been used. Typically, this measure is used for programs that have relatively short lengths of stay. While the number of days in custody is the most precise measure, from a theoretical perspective it is not very likely that increasing one day would have much of an impact on a youth’s likelihood to reoffend. Second, the total amount of time has been calculated in the number of months served. Third,
length of stay has been collapsed into quartiles. Fourth, length of stay has been examined in
groupings of 0 to 3 months, 4 to 6 months, 7 to 9 months, 10 to 12 months, and more than 12
months. Fifth, the median length of stay has been used to split the sample into short and long
term populations. While each of these measures has both strengths and limitations, for the
purpose of this study, length of stay will be measured by total months in custody. Months in
custody provided the most variation and allowed for the final analyses to examine the impact that
each additional month had on the likelihood of a youths engaging in future delinquent behavior.

Risk to reoffend. Another key variable in this study is risk to reoffend. As one of the
primary variables of interest in this dissertation, risk provides a means to addressing differential
rates of reoffending between youths. Furthermore, risk to reoffend was used as one of the
mitigating/aggravating characteristics used by the Release Authority to set length of stay, with
lower risk youths receiving less time than higher risk youths. At the time of this study, DYS
used the Youthful Level of Service/Case Management Inventory (YLS/CMI) to measure a
youth’s likelihood of reoffending. The YLS/CMI is a validated composite risk tool that is
designed for youths from 12 to 17 years of age. The tool is comprised of 42 items, which are
separated into 8 domains. The total score is then collapsed into low, moderate, high, and very
high risk categories. The cutoffs for the YLS/CMI are provided by the developers as suggested
cutoffs to be used to categorize the data. Those youths who score 0 to 8 should be considered
low risk. A score of 9 to 22 results in a moderate risk designation, 23 to 34 is considered high
risk, and 35 to 42 is very high risk. The YLS/CMI has been widely researched and has

5 The length of stay for youth at DYS was determined by a sentencing matrix where risk and seriousness of offense
were used to set a prescribed length of stay. Although risk was used to set the initial length of stay, the release
decision was not generally based on the risk of the youth; therefore, there was enough variation in actual time in
custody to examine the differential effects length of stay might have on re-incarceration.
demonstrated appropriate psychometric properties across a number of studies (see Vincent, Terry, and Maney, 2009). The YLS/CMI was completed by DYS intake staff within the first 45 days of a youth being committed to DYS. The YLS/CMI score was then used to assist in developing individual service plans that were created to track the progress of youths in the system. While the YLS/CMI is often used to reassess youths post-treatment, ODYS did not conduct reassessments using the YLS/CMI and therefore the initial YLS/CMI level will be used to measure the risk to reoffend.

Specialized treatment needs. There are several specialized treatment needs that were associated with longer lengths of stay; therefore these will need to be controlled for in the final model. These needs include mental health, medical problems, special education, fire setting, and substance abuse. Mental health was measured as a set of dichotomous variables including whether a youth had prior mental health treatment, was currently ordered to take psychotropic medication, had any past suicide attempt, and engaged in any previous self-injurious behavior. Medical problems were measured as having a physical condition at intake that needed either immediate medical attention or chronic care. Youth were assessed at intake by an educational specialist to determine if he or she had any special education needs according to the criteria set forth by the Ohio Department of Education. Fire setting was measured as a dichotomous variable with those youths who have a history of fire setting scored as a 1. As for substance abuse, there were two distinct measures, including whether the youths had received substance abuse treatment previously, and if the youths had tested positive from drugs at intake.

Demographics. The demographics of each youth were collected to determine if there are any differential effects of length of stay by age, race, and gender. Even though the age of the subjects is limited based on the restrictions of the juvenile justice system (12 to 21), there
remains the possibility that youths who are younger at intake are more affected by longer stays at DYS. For the purpose of this study, age is measured at the time of intake in years of age. Race is collapsed into Caucasian and youths of color; while ethnicity is measured as Hispanic or non-Hispanic. The youths’ race and ethnicity is captured by the youths’ self-identification.

**Research Design and Analyses**

A single subject research design was used to explore the relationship between length of stay and re-incarceration and the differential effects based on gender, race, age, and risk. First, descriptive statistics were used to describe the population, the length of stay, risk level, and demographic variables. Second, crosstabs was used to examine the distribution of youths across length of stay by subpopulations. The crosstabs provided the ability to determine if there was sufficient variation on the dependent variable within each subgroup. Third, bivariate correlations were calculated using chi-square to determine the impact that length of stay, age, race, gender, and risk have on re-incarceration. Fourth, OLS regression was used to examine the relationship between variables of interest and length of stay. It was important to identify those variables that were correlated with length of stay and/or future recidivism so that they could be controlled for in the final analyses. Fifth, logistic regression was used to identify significant relationships between variables of interest and re-incarceration for a new crime. Sixth, multivariate logistic regression was used to determine the impact that length of stay has on re-incarceration controlling for drug problems, special education, fire setting, mental health issues, medical issues, gender, race, risk and age. Seventh, individual multivariate logistic regression analyses were conducted to determine the impact that gender, race, age, and risk had on re-incarceration controlling for the same variables as the initial model. Once the individual predictors were examined, the eighth set of analyses were conducted examining the interaction effects between
age, gender, and risk to determine if there were subgroups in which LOS had a different effect on outcome. While the results of the logistic regression analyses produce an odds ratio, it is common to transform the odds ratio to predicted probabilities for easier interpretation (DeMaris, 1995). To transform the odds ratio to predicted probabilities, the coefficients and the mean value for each control variable are entered into the following equation:

\[ P = \frac{\text{odds}}{1 + \text{odds}} \]

The odds are calculated by multiplying each coefficient from the logistic regression equation by either the value of the variable of interest (e.g., if determining the odds of a male to be re-incarcerated the value for gender would be set to zero) or the mean value for those used for control variables. Once the odds for the model are calculated, the sum of the odds is divided by the sum of the odds + 1; the result is the probability of the event of interest occurring controlling for all other variables in the model.

**Limitations of the Study**

While this study extends the previous research by examining the impact that individual characteristics have on the effects of length of stay, there are two limitations in the data that should be noted. First, the study relied on a return to incarceration as the measure of future criminal behavior. While this poses some limitation, the fact that the re-incarceration data are highly reliable and a conservative measure of recidivism provides some solace in having a single measure of recidivism. Second, this dissertation was unable to control for any interventions provided to the youths while housed at a DYS facility. The effects of this might be greater if this study focused on sexual offenders since DYS had a structured program for sexual offenders that provided more intensive treatment for sexual offenders than other youths. Third, this dissertation was not able to examine the impact that the facility’s culture might have on future recidivism.
During the period being studied, the non-sexual offenders received minimal services across DYS facilities. Even with these limitations, this dissertation provides significant improvements over the current studies by 1) having a longer follow-up period, 2) controlling for risk, and 3) examining the differential effects of length of stay by gender, race, risk, and age.

Summary

Chapter 3 provides a review of the methods used to collect and analyze the data. This chapter provided a detailed description of the hypothesis to be tested. Second, a review of the legislative rules concerning sentence length for the Ohio juvenile justice system was provided. Third, a description of the data collected and the variables that will be used in the study. Finally, the techniques that will be used to analyze the data were described. Chapter 4 will provide results from the bivariate and multivariate analyses examining the relationship between length of stay and re-incarceration. In addition, the results of the multivariate analyses will be transformed to probabilities of future re-incarceration.
CHAPTER 4: FINDINGS

The analyses conducted for this dissertation used a single subject design to test the hypothesis that length of stay is associated with future recidivism. To test this hypothesis, this chapter is separated into 5 primary analyses. The first section provides the descriptive statistics of the sample. The second section examines the bivariate relationship between variables of interest and re-incarceration. The third section provides the results of the logistic regression models to examine the impact of length of stay on re-incarceration for race, gender, risk, and age controlling for other confounding variables. The fourth section examines the interaction effects of race, risk, and age on LOS and re-incarceration. The fifth section calculates the predicted probabilities of re-incarceration for all youths as well as the differential effects of LOS by gender, race, age, and risk.

Descriptive Statistics

The sample for this dissertation was compiled from the Ohio Department of Youth Services (DYS) and the Ohio Department of Rehabilitation and Correction (ODRC) databases. The data was originally provided to the University of Cincinnati Center for Criminal Justice Research (CCJR) as part of a larger study examining the release decisions of the DYS Release Authority. While the data were collected for this purpose, the richness of the data allowed for the examination of the research questions laid forth in this dissertation. The original sample was of all youths who were housed in DYS from July 1, 2003 to June 30, 2006. For the purpose of this dissertation, a subsample was drawn that included all non-sexual offenders who had served time during 2003 and 2006 and subsequently been received a final release from the facility.

\[\text{6 The Department of Youth Services granted permission to repurpose the data for the release authority as secondary data.}\]
between July 1, 2003 and June 30, 2008. All data relevant to the youths and his or her stay were provided by DYS, while follow-up data were provided by both DYS and ODRC.

Table 1 provides the demographic data for the youths in the sample. As noted, the sample included 90.2 percent male, 57.7 percent youths of color, and average age of 16.1 years of age at intake. Over 65 percent of the sample was 16 or 17 years of age.

Table 1: Demographics

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>4199</td>
<td>90.2</td>
</tr>
<tr>
<td>Female</td>
<td>454</td>
<td>9.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>1964</td>
<td>42.3</td>
</tr>
<tr>
<td>Non-White</td>
<td>2681</td>
<td>57.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age at intake</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>20</td>
<td>0.4</td>
</tr>
<tr>
<td>13</td>
<td>101</td>
<td>2.2</td>
</tr>
<tr>
<td>14</td>
<td>341</td>
<td>7.3</td>
</tr>
<tr>
<td>15</td>
<td>800</td>
<td>17.2</td>
</tr>
<tr>
<td>16</td>
<td>1372</td>
<td>29.5</td>
</tr>
<tr>
<td>17</td>
<td>1632</td>
<td>35.1</td>
</tr>
<tr>
<td>18</td>
<td>339</td>
<td>7.3</td>
</tr>
<tr>
<td>19</td>
<td>33</td>
<td>0.7</td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td>0.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Mean (Min/Max)</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>16.1 (12/20)</td>
<td>1.2</td>
</tr>
</tbody>
</table>

As for delinquency factors, Table 2 shows that a majority of youths fall in the high risk category, with the second largest group scoring moderate risk on the Youthful Level of Service/Case Management Inventory (YLS/CMI). In fact, only 1.4 and .8 percent of the youths fell in the low and very high risk categories respectively. In addition to risk levels, it is noted that a 52.5 percent of the youths were committed on a Felony 4 or 5 offense, while only 11.3 percent were committed on a Felony 1. As noted earlier, the Ohio juvenile system has expanded the availability of mandatory sentences and specifications for youth committed to DYS. This is
reflected in the data as 9.1 percent of the youths committed to DYS were committed on a gang specification, 1.8 percent of the youths were committed as a serious youthful offender, and 4.3 percent of the youths on a mandatory gun specification.\(^7\) While for the final analyses length of stay is calculated as the total amount of time a youth spent in a DYS facility including revocation time, Table 2 provides the length of stay for both the youths’ initial stay as well as subsequent stays. For the total sample, 22.7 percent stayed less than six months in the facility, while 29.6 percent stayed longer than 15 months. The median length of stay was 9 months and ranged from less than 1 month to 64 months. The average youth stayed 10.3 months on their initial commitment and for those revoked the average time in the facility was 11.4 months. Overall, the base re-incarceration rate for a new crime was 40.7 percent.

<table>
<thead>
<tr>
<th>YLS/CMI Categories (MHS)</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk</td>
<td>67</td>
<td>1.4</td>
</tr>
<tr>
<td>Moderate risk</td>
<td>2002</td>
<td>43.1</td>
</tr>
<tr>
<td>High risk</td>
<td>2539</td>
<td>54.7</td>
</tr>
<tr>
<td>Very high risk</td>
<td>37</td>
<td>0.8</td>
</tr>
</tbody>
</table>

**Offense level**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>523</td>
<td>11.3</td>
</tr>
<tr>
<td>F2</td>
<td>838</td>
<td>18.0</td>
</tr>
<tr>
<td>F3</td>
<td>840</td>
<td>18.1</td>
</tr>
<tr>
<td>F4</td>
<td>1307</td>
<td>28.1</td>
</tr>
<tr>
<td>F5</td>
<td>1133</td>
<td>24.4</td>
</tr>
<tr>
<td>Murder</td>
<td>4</td>
<td>0.1</td>
</tr>
</tbody>
</table>

**Serious youthful offender**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>84</td>
<td>1.8</td>
</tr>
<tr>
<td>No</td>
<td>4561</td>
<td>98.2</td>
</tr>
</tbody>
</table>

**Gun specification**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No gun specification</td>
<td>4439</td>
<td>95.6</td>
</tr>
<tr>
<td>1 year</td>
<td>127</td>
<td>2.7</td>
</tr>
<tr>
<td>2 year</td>
<td>19</td>
<td>0.4</td>
</tr>
<tr>
<td>3 year</td>
<td>60</td>
<td>1.3</td>
</tr>
</tbody>
</table>

\(^7\) Note that the gang, gun specification, and SYO decisions were only in place after June 2005; therefore these data only reflect the change in the law for the last year.
Table 2: Delinquency factors

<table>
<thead>
<tr>
<th>Length of stay-initial stay (quartiles)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5 months</td>
<td>1343</td>
<td>28.9</td>
</tr>
<tr>
<td>6 to 8 months</td>
<td>1138</td>
<td>24.5</td>
</tr>
<tr>
<td>9 to 14 months</td>
<td>1209</td>
<td>26.0</td>
</tr>
<tr>
<td>15 to 85 months</td>
<td>955</td>
<td>20.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of stay-initial stay (median)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 8 months</td>
<td>2481</td>
<td>53.4</td>
</tr>
<tr>
<td>9 months to 85</td>
<td>2164</td>
<td>46.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of stay-total stay (quartiles)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 6 months</td>
<td>1055</td>
<td>22.7</td>
</tr>
<tr>
<td>7 to 8 months</td>
<td>1031</td>
<td>22.2</td>
</tr>
<tr>
<td>9 to 14 months</td>
<td>1185</td>
<td>25.5</td>
</tr>
<tr>
<td>15 to 85 months</td>
<td>1374</td>
<td>29.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of stay-total stay (median)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 9 months</td>
<td>2348</td>
<td>50.5</td>
</tr>
<tr>
<td>10 months to 85</td>
<td>2297</td>
<td>49.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Re-incarceration</th>
<th>1891</th>
<th>40.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Crime to DYS/DRC</td>
<td>Mean</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td></td>
<td>(Min/Max)</td>
<td></td>
</tr>
<tr>
<td>YLS/CMI</td>
<td>22.7 (1/39)</td>
<td>5.7</td>
</tr>
</tbody>
</table>

| Length of initial stay at DYS (Days)   | 329.1 (13/1893) | 261.0 |
| Length of initial stay at DYS (Months) | 10.3 (<1/62)    | 7.8   |
| Length of total stay at DYS (Days)     | 367.0 (16/1951) | 246.9 |
| Length of total stay at DYS (Months)   | 11.4 (<1/63)    | 8.1   |

The youths in DYS also present with specialized treatment needs. Table 3 identifies that over 80 percent of the youths released from DYS during the study time period had received mental health treatment prior to his or her commitment, with 35.3 percent of the youths prescribed psychotropic medication at intake. In fact, 17.6 percent of the youths in the sample had made a suicide attempt. In addition to mental health issues, 62.8 percent of the youths had a medical condition that needed medical attention, 14.7 percent were identified as meeting Ohio Department of Education’s standards for special education, and 17 percent of the youths had a history of fire setting. As for substance abuse needs, 42.8 percent of the youths had received
some substance abuse treatment prior to their commitment, with 9.4 percent testing positive for drugs at intake.

Table 3: Specialized treatment needs

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past Mental Health Tx</td>
<td>3786</td>
<td>81.5</td>
</tr>
<tr>
<td>Psychotropic Medication</td>
<td>1639</td>
<td>35.3</td>
</tr>
<tr>
<td>Suicide Attempt</td>
<td>818</td>
<td>17.6</td>
</tr>
<tr>
<td>Self-Injurious Behavior</td>
<td>921</td>
<td>19.8</td>
</tr>
<tr>
<td>Medical Problems</td>
<td>2919</td>
<td>62.8</td>
</tr>
<tr>
<td>Special Education</td>
<td>684</td>
<td>14.7</td>
</tr>
<tr>
<td>Fire Setting</td>
<td>790</td>
<td>17.0</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past Sub Abuse Tx</td>
<td>1990</td>
<td>42.8</td>
</tr>
<tr>
<td>Positive Drug Screen</td>
<td>438</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Table 4 provides a review of the percentage of youths that fall within the overall quartiles by demographics. Overall, males had a longer length of stay than females. As noted, 22.4 percent of the males stayed 5 months or less, while 30.0 percent stayed longer at least 14 months. Comparatively, 25.6 percent of the females stayed at DYS for 5 months or less while 25.3 percent stayed 14 months or greater. As for race, white youths stayed fewer days on average than youths of color, with 33 percent of the youths of color staying longer than 13 months and only 24.8 percent of the white youths. The risk levels appear to have biggest discrepancies in length of stay with 40.3 percent of low risk youths being released less than 6 months and 45.9 percent of the very high risk being held longer than 13 months. Even the difference between moderate and high risk is significant. High risk youths stayed on average 38.8 days longer than moderate risk youths with only 18.6 percent of the high risk being release prior to six months compared to 27.6 percent of the moderate risk youths. In examining age at intake, the youths who fell in the 11 to 14 year-old category stayed just over 175 days longer than those youths who
were committed between 17 and 20. Only 13.9 percent of the 11 to 14 year old youths stayed less than 6 months while 46.3 percent of these youths stayed 14 months or greater.

Table 4: Percentage of youths by total length of stay

<table>
<thead>
<tr>
<th>Gender</th>
<th>Days (x)</th>
<th>0 to 5 months</th>
<th>6 to 8 months</th>
<th>9 to 13 months</th>
<th>14 to 65 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males (4191)</td>
<td>370.3</td>
<td>22.4</td>
<td>21.7</td>
<td>25.8</td>
<td>30.0</td>
</tr>
<tr>
<td>Females (454)</td>
<td>336.6</td>
<td>25.6</td>
<td>26.4</td>
<td>22.7</td>
<td>25.3</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (1964)</td>
<td>337.7</td>
<td>25.2</td>
<td>24.6</td>
<td>25.4</td>
<td>24.8</td>
</tr>
<tr>
<td>Youths of Color (2681)</td>
<td>388.5</td>
<td>20.9</td>
<td>20.4</td>
<td>25.6</td>
<td>33.0</td>
</tr>
<tr>
<td>Risk Level (MHS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (67)</td>
<td>349.9</td>
<td>40.3</td>
<td>10.4</td>
<td>20.9</td>
<td>28.4</td>
</tr>
<tr>
<td>Moderate (2002)</td>
<td>345.9</td>
<td>27.6</td>
<td>22.3</td>
<td>24.7</td>
<td>25.4</td>
</tr>
<tr>
<td>High (2539)</td>
<td>383.1</td>
<td>18.6</td>
<td>22.4</td>
<td>26.3</td>
<td>32.7</td>
</tr>
<tr>
<td>Very High (37)</td>
<td>441.8</td>
<td>8.1</td>
<td>21.6</td>
<td>24.3</td>
<td>45.9</td>
</tr>
<tr>
<td>Age at Intake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 to 14 (462)</td>
<td>487.3</td>
<td>13.9</td>
<td>16.0</td>
<td>23.8</td>
<td>46.3</td>
</tr>
<tr>
<td>15 to 16 (2167)</td>
<td>391.9</td>
<td>18.6</td>
<td>20.7</td>
<td>26.3</td>
<td>34.3</td>
</tr>
<tr>
<td>17 to 20 (2007)</td>
<td>312.1</td>
<td>29.1</td>
<td>25.3</td>
<td>25.0</td>
<td>20.6</td>
</tr>
</tbody>
</table>

When examining the median stay in Table 5, 49.8 percent of the males stayed less than 10 months while 57 percent of the females were released within the same time frame. As noted, youths of color were more likely to have longer stays than white youths with nearly 10 percent more youths of color staying 10 months longer than white youths. Not surprising, the average lower risk youths experienced significantly shorter stays than the very high risk with just over 25 percent more high risk youths staying at least 10 months. Similarly, youths who were younger at intake were significantly more likely to stay 10 months or longer, while only 39.6 percent of those 17 to 20 stayed as long. While there are potentially many contributing factors, one of the primary reasons youths who are older are less likely to spend time in DYS is due to the mandatory release at 21 and a desire by the Release Authority to release a youths to some community supervision and not permit them just to age out of the system.
Table 5: Percentage of youths by median length of total stay

<table>
<thead>
<tr>
<th></th>
<th>9 or Fewer Months</th>
<th>10 or more months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males (n=4199)</td>
<td>49.8</td>
<td>50.2</td>
</tr>
<tr>
<td>Females (n=454)</td>
<td>57.0</td>
<td>43.0</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (n=1964)</td>
<td>56.7</td>
<td>43.3</td>
</tr>
<tr>
<td>Youths of Color (n=2681)</td>
<td>46.1</td>
<td>53.9</td>
</tr>
<tr>
<td>Risk Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (n=67)</td>
<td>55.2</td>
<td>44.8</td>
</tr>
<tr>
<td>Moderate (n=2002)</td>
<td>54.5</td>
<td>45.5</td>
</tr>
<tr>
<td>High (n=2539)</td>
<td>47.6</td>
<td>52.4</td>
</tr>
<tr>
<td>Very High (n=37)</td>
<td>29.7</td>
<td>70.3</td>
</tr>
<tr>
<td>Age at Intake*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 to 14 (n=462)</td>
<td>33.3</td>
<td>66.7</td>
</tr>
<tr>
<td>15 to 16 (n=2167)</td>
<td>45.1</td>
<td>54.9</td>
</tr>
<tr>
<td>17 to 20 (n=2007)</td>
<td>60.4</td>
<td>39.6</td>
</tr>
</tbody>
</table>

**Bivariate Logistic Regression Analyses**

Table 6 provides the re-incarceration rates for a new crime by length of stay. As noted, as youths remained longer in DYS the re-incarceration rates were significantly lower for those youths who remained less than six months, increased slightly from those that stayed 9 to 13 months, and then increased significantly for those that stayed over 13 months. As for gender, males were significantly more likely to be re-incarcerated than females. Interestingly, only 11 percent of the youths were re-incarcerated upon release while males were re-incarcerated at 43.9 percent. As noted, youths of color were more likely to be re-incarcerated than Caucasian youths 47.3 percent to 31.8 percent respectively. As for risk, the categories of the YLS/CMI did not effectively discriminate between the categories of risk. Low risk youths re-offended at the lowest rate 26.9 percent, compared to 40.8 percent for moderate and 41.2 percent for high risk youths, while the very high risk youths were re-incarcerated 29.7 percent of the time. In
addition, younger youths were less likely to be re-incarcerated, while youths 15 and older were re-incarcerated at similar rates.

Table 6: Variables of interest by re-incarceration

<table>
<thead>
<tr>
<th>Variable</th>
<th>No</th>
<th>Re-incarceration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 6 months</td>
<td>694 (65.8%)</td>
</tr>
<tr>
<td></td>
<td>6 to 8 months</td>
<td>628 (60.9%)</td>
</tr>
<tr>
<td></td>
<td>9 to 13 months</td>
<td>715 (60.3%)</td>
</tr>
<tr>
<td></td>
<td>14 to 64 months</td>
<td>717 (52.2%)</td>
</tr>
<tr>
<td>Length of stay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>2350 (56.1%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>404 (89.0%)</td>
</tr>
<tr>
<td>Race</td>
<td>Caucasian</td>
<td>1340 (68.2%)</td>
</tr>
<tr>
<td></td>
<td>Youths of Color</td>
<td>1414 (52.7%)</td>
</tr>
<tr>
<td>Risk (MHS)</td>
<td>Low</td>
<td>49 (73.1%)</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>1186 (59.2%)</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>1493 (58.8%)</td>
</tr>
<tr>
<td></td>
<td>Very High</td>
<td>26 (70.3%)</td>
</tr>
<tr>
<td>Age at intake</td>
<td>11 to 14</td>
<td>303 (65.6%)</td>
</tr>
<tr>
<td></td>
<td>15 to 16</td>
<td>1247 (57.5%)</td>
</tr>
<tr>
<td></td>
<td>17 to 20</td>
<td>1200 (59.8%)</td>
</tr>
</tbody>
</table>

There were several characteristics of youths that were correlated with longer stays at DYS. Table 7 provides the bivariate relationships for these variables. Specifically, youths who had a history of suicide attempts or self-injurious behavior were more likely to remain at DYS longer. Similarly, youths who were designated as needing special education services and those that have a history of setting fires were more likely to remain at DYS for longer periods of time. As for those youths that entered DYS with a medical problem or a substance abuse problem, they were significantly less likely to stay at DYS for longer periods of time. Based on these findings, past suicide attempts, self-injurious behavior, medical problems, special education, fire setting,
past substance abuse treatment, and positive drug screens will be used as control variables in the
final analyses.

Table 7: Bivariate Relationship between confounding variables and length of total stay (months)

<table>
<thead>
<tr>
<th>Mental Health</th>
<th>Unstandardized Coefficients</th>
<th>SE</th>
<th>Pearson’s correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior Mental Health Tx</td>
<td>-.342</td>
<td>.305</td>
<td>-.016</td>
</tr>
<tr>
<td>Psychotropic Medication</td>
<td>-.041</td>
<td>.248</td>
<td>-.002</td>
</tr>
<tr>
<td>Past Suicide Attempt</td>
<td>.725</td>
<td>.311</td>
<td>.034*</td>
</tr>
<tr>
<td>Self-Injurious Behavior</td>
<td>.930</td>
<td>.297</td>
<td>.046**</td>
</tr>
<tr>
<td>Medical Problems</td>
<td>-1.038</td>
<td>.245</td>
<td>-.062***</td>
</tr>
<tr>
<td>Special Education</td>
<td>2.107</td>
<td>.333</td>
<td>.093***</td>
</tr>
<tr>
<td>Fire Setting</td>
<td>1.063</td>
<td>.315</td>
<td>.049**</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past Substance Abuse Tx</td>
<td>-.823</td>
<td>.239</td>
<td>-.050**</td>
</tr>
<tr>
<td>Positive Drug Screen</td>
<td>-2.353</td>
<td>.404</td>
<td>-.085***</td>
</tr>
</tbody>
</table>

*p ≤ .05, ** p ≤ .01, *** p ≤ .001

Table 8 provides the results of a series of logistic regression equations examining the
bivariate relationships between length of stay, demographic characteristics, and measures of risk
with re-incarceration rates. The first set of bivariate relationships is between the youths’ total
length of stay (initial LOS + revocation time) and re-incarceration. Similar to initial length of
stay, total length of stay was highly correlated with re-incarceration, suggesting youths with a
longer stay at DYS had higher recidivism rates. The second set of bivariate relationships
examined is between race, age, and gender and re-incarceration. As noted, youths of color were
more likely to be re-incarcerated as were males while age at intake was not significantly
correlated with being re-incarcerated. The third set of bivariate relationships is between risk and
re-incarceration. The overall composite YLS/CMI risk score was not correlated with re-
incarceration, but when the YLS/CMI score was separated into the MHS risk levels, those youths
scoring moderate and high risk were more likely to be re-incarcerated than those youths rating as
low risk. The last set of bivariate relationships examined the relationship that mental health, medical problems, fire setting, and substance abuse issues has with re-incarceration. As noted, past suicide attempts was the only factor that was correlated with re-incarceration, finding that youths who have no history of suicide attempts were more likely to be re-incarcerated.
Table 8: Bivariate Relationship between variables of interest and re-incarceration for new crime

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Exp(B)</th>
<th>Pearson’s correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of total stay (Days)</td>
<td>.001</td>
<td>1.001</td>
<td>.089***</td>
</tr>
<tr>
<td>Length of total stay (Months)</td>
<td>.023</td>
<td>1.023</td>
<td>.092***</td>
</tr>
<tr>
<td>Length of total stay (Median)</td>
<td>.357</td>
<td>1.429</td>
<td>.088***</td>
</tr>
<tr>
<td>Length of total stay (Quartile)</td>
<td>.176</td>
<td>1.193</td>
<td>.097***</td>
</tr>
<tr>
<td>Race (Caucasian = 0)</td>
<td>.655</td>
<td>1.924</td>
<td>.156***</td>
</tr>
<tr>
<td>Gender (Male = 0)</td>
<td>-1.845</td>
<td>.158</td>
<td>-.199***</td>
</tr>
<tr>
<td>Age at Intake</td>
<td>.023</td>
<td>1.024</td>
<td></td>
</tr>
<tr>
<td>Risk (Composite Score)</td>
<td>.007</td>
<td>1.007</td>
<td>.020</td>
</tr>
<tr>
<td>Risk (MHS)</td>
<td></td>
<td>.011</td>
<td></td>
</tr>
<tr>
<td>Prior Mental Health Tx</td>
<td>.129</td>
<td>1.138</td>
<td></td>
</tr>
<tr>
<td>Psychotropic Medication</td>
<td>-.115</td>
<td>.892</td>
<td>-.027</td>
</tr>
<tr>
<td>Past Suicide Attempt</td>
<td>-.341</td>
<td>.711</td>
<td>-.062***</td>
</tr>
<tr>
<td>Medical Problems</td>
<td>-.066</td>
<td>.936</td>
<td>-.016</td>
</tr>
<tr>
<td>Fire Setting</td>
<td>.078</td>
<td>1.081</td>
<td>.014</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past Substance Abuse Tx</td>
<td>.003</td>
<td>1.003</td>
<td>.001</td>
</tr>
<tr>
<td>Positive Drug Screen</td>
<td>-.141</td>
<td>.869</td>
<td>-.020</td>
</tr>
</tbody>
</table>

*p ≤ .05, ** p ≤ .01, *** p ≤ .001
Logistic Regression Models

Tables 9 through 19 provide the results of the bivariate and multivariate logistic regression analyses examining the predictors of re-incarceration for all youths, as well as separate analyses for race, gender, risk, and age. Table 10 examines the relationship between all youths and re-incarceration controlling for potential confounding variables. Model A examines the bivariate relationship between total length of stay and re-incarceration. As noted, total length of stay in months is significant and the $R^2$ is .011. Model B includes only those variables that were identified as potential confounding variables and were treated as control variables. As noted, the overall model was significant resulting in a $R^2$ of .102. Model C provides the effects of length of stay by months controlling for those variables included in Model B. As noted, while controlling for risk, gender, race, age at intake, and those variables correlated with longer stays, length of stay measured in months was significant and positively correlated with re-incarceration, suggesting that the more months any youth stayed at DYS the more likely they were to be re-incarcerated. The overall $R^2$ for Model C increased slightly to .108 from .102 for Model B.
Table 9: Logistic regression predicting re-incarceration for new crime (N = 4645)

<table>
<thead>
<tr>
<th></th>
<th>Model A⁸</th>
<th>Model B</th>
<th>Model C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>OR</td>
</tr>
<tr>
<td>Positive drug screen at intake</td>
<td>-.079</td>
<td>.109</td>
<td>.924</td>
</tr>
<tr>
<td>Special education</td>
<td>.082</td>
<td>.089</td>
<td>1.085</td>
</tr>
<tr>
<td>Past substance abuse treatment</td>
<td>.083</td>
<td>.065</td>
<td>1.086</td>
</tr>
<tr>
<td>Fire setting</td>
<td>.072</td>
<td>.084</td>
<td>1.074</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>-.021</td>
<td>.09</td>
<td>.980</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>-.016</td>
<td>.097</td>
<td>.984</td>
</tr>
<tr>
<td>Medical needs</td>
<td>.066</td>
<td>.066</td>
<td>1.069</td>
</tr>
<tr>
<td>Gender</td>
<td>-2.021</td>
<td>.162</td>
<td>.133***</td>
</tr>
<tr>
<td>YLS/CMI</td>
<td>.037</td>
<td>.006</td>
<td>1.037***</td>
</tr>
<tr>
<td>Race</td>
<td>.675</td>
<td>.067</td>
<td>1.963***</td>
</tr>
<tr>
<td>Age at intake</td>
<td>.039</td>
<td>.027</td>
<td>1.040</td>
</tr>
<tr>
<td>LOS (Months)</td>
<td>.023</td>
<td>.004</td>
<td>1.023***</td>
</tr>
<tr>
<td>Constant</td>
<td>-.641</td>
<td>.004</td>
<td>2.188</td>
</tr>
<tr>
<td>Correct predictions</td>
<td>59.4</td>
<td>61.4</td>
<td>61.7</td>
</tr>
<tr>
<td>Nagelkerke R²</td>
<td>.011</td>
<td>.102</td>
<td>.108</td>
</tr>
<tr>
<td>Model Chi-Square (df)</td>
<td>39.032***</td>
<td>365.070***</td>
<td>387.003***</td>
</tr>
<tr>
<td>Block Chi-Square (df)</td>
<td>(1)</td>
<td>(11)</td>
<td>(12)</td>
</tr>
</tbody>
</table>

⁸ Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
Table 10 provides the results of the logistic regression models examining the effects of LOS on re-incarceration for males only. Model D provides the results of the bivariate analysis examining the effects of total LOS with re-incarceration for male offenders. As noted, the bivariate relationship between total LOS and re-incarceration was significant and resulted in a $R^2$ of .010. Model B examined the impact of the control variables on re-incarceration for males. This model was also significant, resulting in a $R^2$ of .049. Model F included the same measures of control as noted in Model E. Interesting to note, the only two control variables that were significant in Model E were YLS/CMI risk score and race. The $R^2$ for Model C was .049. When LOS was added to the model, the $R^2$ increased to .055 suggesting that while controlling for other confounding variables, males who stayed longer at DYS were more likely to be re-incarcerated within 3 years post-release. While the $R^2$ is low for the model, the relationship between length of stay and re-incarceration remained significant.
Table 10: Logistic regression predicting re-incarceration of male offenders for a new crime \((N = 4191)\)

<table>
<thead>
<tr>
<th>Model D(^9)</th>
<th>Model E</th>
<th>Model F</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>SE</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>Positive drug screen at intake</td>
<td>-.060</td>
<td>.112</td>
</tr>
<tr>
<td>Special education</td>
<td>.067</td>
<td>.091</td>
</tr>
<tr>
<td>Past substance abuse treatment</td>
<td>.078</td>
<td>.067</td>
</tr>
<tr>
<td>Fire setting</td>
<td>.068</td>
<td>.086</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>-.010</td>
<td>.097</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>-.051</td>
<td>.101</td>
</tr>
<tr>
<td>Medical needs</td>
<td>.065</td>
<td>.067</td>
</tr>
<tr>
<td>YLS/CMI</td>
<td>.038</td>
<td>.067</td>
</tr>
<tr>
<td>Race</td>
<td>.713</td>
<td>.069</td>
</tr>
<tr>
<td>Age at intake</td>
<td>.041</td>
<td>.027</td>
</tr>
<tr>
<td>LOS (Months)</td>
<td>.021</td>
<td>.004</td>
</tr>
<tr>
<td>Constant</td>
<td>-.489</td>
<td>.055</td>
</tr>
<tr>
<td>Correct predictions</td>
<td>56.2</td>
<td>58.7</td>
</tr>
<tr>
<td>Nagelkerke R(^2)</td>
<td>.010</td>
<td>.049</td>
</tr>
<tr>
<td>Model Chi-Square (df)</td>
<td>30.268***</td>
<td>157.227***</td>
</tr>
<tr>
<td>Block Chi-Square (df)</td>
<td>(1)</td>
<td>(10)</td>
</tr>
</tbody>
</table>

\(^9\) Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
Similar to the previous tables, Table 11 provides three models for female offenders. Model G provides the results of the bivariate relationship between total LOS and re-incarceration, resulting in a significant relationship and a $R^2$ of .02. Model H examines the relationship of the control variables to re-incarceration for female offenders, of which none were significant. In addition, the overall model was not significant. Model I provides the results of the effects of total length of stay on female offenders controlling for the potential confounding variables. While total LOS was still predictive of re-incarceration, the model was no longer significant. Although the overall model was not significant, total length of stay remained significant suggesting that females who stay longer at DYS are more likely to be re-incarcerated within 3 years of release.
Table 11: Logistic regression predicting re-incarceration of female offenders for a new crime (N = 454)

<table>
<thead>
<tr>
<th></th>
<th>Model G</th>
<th>B</th>
<th>SE</th>
<th>Odds Ratio</th>
<th>B</th>
<th>SE</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive drug screen at intake</td>
<td>-.414</td>
<td>.501</td>
<td>.661</td>
<td></td>
<td>-.325</td>
<td>.505</td>
<td>.723</td>
</tr>
<tr>
<td>Special education</td>
<td>.591</td>
<td>.479</td>
<td>1.805</td>
<td></td>
<td>.413</td>
<td>.487</td>
<td>1.511</td>
</tr>
<tr>
<td>Past substance abuse treatment</td>
<td>.206</td>
<td>.323</td>
<td>1.229</td>
<td></td>
<td>.135</td>
<td>.328</td>
<td>1.145</td>
</tr>
<tr>
<td>Fire setting</td>
<td>.298</td>
<td>.417</td>
<td>1.348</td>
<td></td>
<td>.233</td>
<td>.421</td>
<td>1.262</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>-.312</td>
<td>.361</td>
<td>.732</td>
<td></td>
<td>-.356</td>
<td>.368</td>
<td>.700</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>.431</td>
<td>.345</td>
<td>1.538</td>
<td></td>
<td>.424</td>
<td>.352</td>
<td>1.528</td>
</tr>
<tr>
<td>Medical needs</td>
<td>.051</td>
<td>.404</td>
<td>1.052</td>
<td></td>
<td>.217</td>
<td>.423</td>
<td>1.242</td>
</tr>
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</table>

---

10 Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
Table 12 provides the results of the bivariate and multivariate logistic regression examining the effects of total LOS on re-incarceration for Caucasian youths. Model J provides the bivariate relationship between total LOS and re-incarceration. As noted, the bivariate relationship resulted in a positive and significant relationship suggesting that the longer Caucasian youths remain in DYS the more likely they are to be re-incarcerated within the next 3 years. Model K provides the impact of the control variables on re-incarceration. As noted for Caucasians, those that tested positive for drugs at intake were less likely to be re-incarcerated, as well as females and lower risk youths. The overall $R^2$ for Model K was .063. When controlling for the variables in Model K, the relationship between total LOS and re-incarceration remained significant and positively correlated suggesting that even when controlling for potentially confounding variables, Caucasian youths who stayed longer in DYS were significantly more likely to be re-incarcerated within 3 years post-release.
Table 12: Logistic regression predicting re-incarceration of Caucasian offenders for a new crime (N = 1964)

<table>
<thead>
<tr>
<th></th>
<th>Model J</th>
<th>Odds Ratio</th>
<th>Model K</th>
<th>Odds Ratio</th>
<th>Model L</th>
<th>Odds Ratio</th>
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<td>SE</td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
</tr>
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<td>.693*</td>
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<td>.176</td>
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<td>.150</td>
<td>1.153</td>
<td>.086</td>
<td>.571</td>
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<td>.102</td>
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<td>.103</td>
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<td>.116</td>
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<td>1.123</td>
<td>.100</td>
<td>.122</td>
<td>1.105</td>
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<td>Self-injurious behavior</td>
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<td>.992</td>
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<td>1.023</td>
<td>.046</td>
<td>.107</td>
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<td>YLS/CMI</td>
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<td>.037</td>
<td>.010</td>
<td>1.038***</td>
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<td>.084</td>
<td>.044</td>
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<td>1.030***</td>
<td>.026</td>
<td>.007</td>
<td>1.026***</td>
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<td>68</td>
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<td>.063</td>
<td>.072</td>
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<td>90.073***</td>
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11 Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
Table 13 provides the results of the bivariate and logistic regression for youths of color. As noted in Model M, the total number of months is positively correlated with re-incarceration, but the amount of explained variation is low, resulting in a $R^2$ of .005. Examining the control variables for youths of color, only gender and YLS/CMI score were significant in predicting re-incarceration with the overall model being significant and a $R^2$ of .087. While controlling for Model N, total LOS remained significant and positively correlated with re-incarceration suggesting that like Caucasians, youths of color were more likely to be re-incarcerated the longer they stayed.
Table 13: Logistic regression predicting re-incarceration of youths of color for a new crime (N = 2681)

<table>
<thead>
<tr>
<th></th>
<th>Model M 12</th>
<th></th>
<th>Odds Ratio</th>
<th>Model N</th>
<th></th>
<th>Odds Ratio</th>
<th>Model O</th>
<th></th>
<th>Odds Ratio</th>
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<td>.146</td>
<td>1.173</td>
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<tr>
<td>at intake</td>
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<tr>
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<td>1.036</td>
<td>.031</td>
<td>.112</td>
<td>1.031</td>
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<td>Past substance</td>
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<td>.086</td>
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<td>.140</td>
<td>.086</td>
<td>1.150</td>
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<td>.117</td>
<td>1.051</td>
<td>.043</td>
<td>.117</td>
<td>1.044</td>
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<td>.825</td>
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<td>.084</td>
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<td>.085</td>
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<td>.015</td>
<td>.005</td>
<td>1.015**</td>
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</tr>
</tbody>
</table>

12 Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
For those youths who were 15 or younger at intake, Table 14 provided the impact that total length of stay has on re-incarceration. Model P provided the results of the bivariate relationship between younger youths and re-incarceration. As noted, those youths who are 15 or younger were significantly more likely to be re-incarcerated than those that were older upon intake. Model Q provided the results of the multivariate logistic regression examining the impact of the control variables on re-incarceration. For younger youths, those with past substance abuse treatment, medical needs at intake, and those that are male were significantly more likely to be re-incarcerated. Model R demonstrated that while controlling for these variables, total LOS still remained significant and positive suggesting that younger youths who remain in DYS for longer periods of time were more likely to be re-incarcerated than those staying shorter periods of time. It should also be noted that adding total LOS to the model increases the $R^2$ from .100 to .137 suggesting that the relationship between LOS and re-incarceration for younger offenders was not only significant but also substantive.
<table>
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<tr>
<th></th>
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<th></th>
<th>Model R</th>
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<td>Odds</td>
<td>B</td>
<td>SE</td>
<td>Odds</td>
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<td>.223</td>
<td>.919</td>
<td>.001</td>
<td>.227</td>
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<td>.142</td>
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<td>.122</td>
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<td>.129</td>
<td>1.290*</td>
<td>.259</td>
<td>.131</td>
<td>1.296*</td>
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<td>.989</td>
<td>-.028</td>
<td>.157</td>
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<td>1.060</td>
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<td>.984</td>
<td>-.033</td>
<td>.186</td>
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<td>.012</td>
<td>1.003</td>
<td>-.006</td>
<td>.012</td>
<td>.994</td>
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<td>1.043***</td>
<td>.040</td>
<td>.007</td>
<td>1.041***</td>
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<td>63.8</td>
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<td>.137</td>
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<td></td>
<td>(10)</td>
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<td>(11)</td>
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</tr>
</tbody>
</table>

13 Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
Table 15 provided the results from the bivariate and multivariate logistic regression analyses for older youths. In Model S, the total LOS was positively correlated with re-incarceration explaining .4 percent of the variation. In examining the effects of the control variables on re-incarceration, higher risk youths, males, and youths of color were more likely to be re-incarcerated. The overall model was significant and had a $R^2$ of .110. Model U shows the impact of adding total LOS. As noted, total LOS was no longer predictive of re-incarceration when controlling for the variables in Model T, suggesting that longer stays had no impact on older youths while controlling for other predictors.
Table 15: Logistic regression predicting re-incarceration of older offenders (16 or older) for a new crime (N = 3383)

<table>
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<tr>
<th></th>
<th>Model S&lt;sup&gt;14&lt;/sup&gt;</th>
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<th>Model T</th>
<th></th>
<th>Model U</th>
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<td>SE</td>
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<td>B</td>
<td>SE</td>
<td>Odds Ratio</td>
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<td>.115</td>
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<td>.047</td>
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<tr>
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<td>.076</td>
<td>1.023</td>
<td>.032</td>
<td>.076</td>
<td>1.032</td>
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<td>Fire setting</td>
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<td>.100</td>
<td>1.109</td>
<td>.099</td>
<td>.100</td>
<td>1.104</td>
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<td>.115</td>
<td>.994</td>
<td>-.012</td>
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<td>.988</td>
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<td>.121***</td>
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<td>.078</td>
<td>2.017***</td>
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<td>LOS (Months)</td>
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<td>.005</td>
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<td>Nagelkerke R&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>.110</td>
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<td>.111</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>14</sup> Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
For the purpose of Tables 16 and 17, risk was collapsed into a dichotomous measure of low/moderate and high/very high risk. The primary reason for this was that the majority of cases fell in the moderate and high risk categories with less than 3 percent of the sample falling in the low and very high categories, making the results of the logistic regression for these outer categories unstable. Given these limitations, Model V in Table 16 provided the results of the bivariate relationship between total LOS and re-incarceration for lower risk youths. As noted, total LOS was significant and positively correlated with re-incarceration with .7 percent of the variation explained. Model W provides the results of the multivariate logistic regression model examining the effects of the control variables on re-incarceration. As noted, the only variables found to be significant were past substance abuse treatment, gender, and race. The overall model was significant and the $R^2 = .054$. While controlling for these variables, total LOS remained significant suggesting that lower risk youths who stayed longer at DYS were more likely to be re-incarcerated upon release. While the overall model remained significant, the $R^2$ only increased by .005 when adding total LOS.
Table 16: *Logistic regression predicting re-incarceration of lower risk youths for a new crime (N = 2069)*

<table>
<thead>
<tr>
<th></th>
<th>Model V(^{15})</th>
<th>Model W</th>
<th>Model X</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>Positive drug screen at intake</td>
<td>-.072</td>
<td>.161</td>
<td>.930</td>
</tr>
<tr>
<td>Special education</td>
<td>.136</td>
<td>.137</td>
<td>1.146</td>
</tr>
<tr>
<td>Past substance abuse treatment</td>
<td>.213</td>
<td>.099</td>
<td>1.237*</td>
</tr>
<tr>
<td>Fire setting</td>
<td>-.021</td>
<td>.140</td>
<td>.979</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>.039</td>
<td>.153</td>
<td>1.040</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>.191</td>
<td>.158</td>
<td>1.210</td>
</tr>
<tr>
<td>Medical needs</td>
<td>.127</td>
<td>.097</td>
<td>1.136</td>
</tr>
<tr>
<td>Age Intake</td>
<td>-.059</td>
<td>.039</td>
<td>.943</td>
</tr>
<tr>
<td>Gender</td>
<td>-2.377</td>
<td>.736</td>
<td>.093**</td>
</tr>
<tr>
<td>Race</td>
<td>.702</td>
<td>.101</td>
<td>2.017***</td>
</tr>
<tr>
<td>LOS (Months)</td>
<td>.019</td>
<td>.006</td>
<td>1.019***</td>
</tr>
<tr>
<td>Constant</td>
<td>-.597</td>
<td>.076</td>
<td>.951</td>
</tr>
<tr>
<td>Correct predictions (%)</td>
<td>59.0</td>
<td>61.0</td>
<td>60.5</td>
</tr>
<tr>
<td>Nagelkerke R(^2)</td>
<td>.007</td>
<td>.054</td>
<td>.059</td>
</tr>
<tr>
<td>Model Chi-Square (df)</td>
<td>11.218***</td>
<td>84.406***</td>
<td>91.677***</td>
</tr>
<tr>
<td>Block Chi-Square (df)</td>
<td>(1)</td>
<td>(10)</td>
<td>(11)</td>
</tr>
</tbody>
</table>

\(^{15}\) Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
Similar to the previous table, Table 17 provided the results for those youths who scored high and very high risk on the YLS/CMI. Model Y provided the results of the bivariate logistic regression examining the impact of total LOS on re-incarceration for higher risk youths. As noted, the longer higher risk youths remain in DYS the more likely they were to be re-incarcerated. Model Z provided the results of the multivariate relationship between the control variables and re-incarceration. As noted among higher risk youths, older youths were more likely to be re-incarcerated, as well as males and youths of color. While controlling for these variables, total LOS remained significant and positively correlated with re-incarceration, suggesting that higher risk youths remaining longer in DYS were more likely to be re-incarcerated.

It should be noted that risk, age, and race often remained significant in the full models suggesting that there may be an interaction effect between race, age, and risk and re-incarceration. For this reason, the next set of analyses examined the impact of the interaction effects between race, age, and risk. While gender would also be of interest, due to the small number of females in the sample, splitting females by multiple categories led to low samples across each cell, leading to unstable results and therefore excluded from the following analyses.
Table 17: Logistic regression predicting re-incarceration of higher risk youths for a new crime (N = 2576)

<table>
<thead>
<tr>
<th></th>
<th>Model Y</th>
<th></th>
<th>Model Z</th>
<th></th>
<th>Model AA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Odds</td>
<td>B</td>
<td>SE</td>
<td>Odds</td>
</tr>
<tr>
<td>Positive drug screen at</td>
<td>-.075</td>
<td>.148</td>
<td>.928</td>
<td>-.034</td>
<td>.149</td>
<td>.967</td>
</tr>
<tr>
<td>intake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special education</td>
<td>.074</td>
<td>.118</td>
<td>1.077</td>
<td>.052</td>
<td>.118</td>
<td>1.053</td>
</tr>
<tr>
<td>Past substance abuse</td>
<td>.061</td>
<td>.086</td>
<td>1.063</td>
<td>.071</td>
<td>.086</td>
<td>1.047</td>
</tr>
<tr>
<td>treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire setting</td>
<td>.145</td>
<td>.105</td>
<td>1.156</td>
<td>.132</td>
<td>.105</td>
<td>1.141</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>-.024</td>
<td>.117</td>
<td>.976</td>
<td>-.037</td>
<td>.118</td>
<td>.963</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>-.071</td>
<td>.122</td>
<td>.931</td>
<td>-.100</td>
<td>.123</td>
<td>.905</td>
</tr>
<tr>
<td>Medical needs</td>
<td>-.018</td>
<td>.090</td>
<td>.982</td>
<td>.004</td>
<td>.090</td>
<td>1.004</td>
</tr>
<tr>
<td>Age Intake</td>
<td>.103</td>
<td>.036</td>
<td>1.109**</td>
<td>.144</td>
<td>.039</td>
<td>1.154***</td>
</tr>
<tr>
<td>Gender</td>
<td>-1.839</td>
<td>.166</td>
<td>.159***</td>
<td>-1.800</td>
<td>.166</td>
<td>.165***</td>
</tr>
<tr>
<td>Race</td>
<td>.647</td>
<td>.090</td>
<td>1.910***</td>
<td>.611</td>
<td>.090</td>
<td>1.842***</td>
</tr>
<tr>
<td>LOS (Months)</td>
<td>.026</td>
<td>.005</td>
<td>1.027***</td>
<td>.024</td>
<td>.005</td>
<td>1.024***</td>
</tr>
<tr>
<td>Constant</td>
<td>-.680</td>
<td>.072</td>
<td>-2.198</td>
<td>.595</td>
<td>-3.123</td>
<td>.636</td>
</tr>
<tr>
<td>Correct predictions (%)</td>
<td>59.4</td>
<td>63.4</td>
<td>63.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nagelkerke R²</td>
<td>.015</td>
<td></td>
<td>.136</td>
<td></td>
<td>.146</td>
<td></td>
</tr>
<tr>
<td>Model Chi-Square (df)</td>
<td>28.587***</td>
<td>(1)</td>
<td>274.956***</td>
<td>(10)</td>
<td>294.538***</td>
<td>(11)</td>
</tr>
<tr>
<td>Block Chi-Square (df)</td>
<td></td>
<td></td>
<td>19.583***</td>
<td>(1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16 Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
Table 18 provided the results of the bivariate and logistic regression models examining the effects of length of stay on re-incarceration for males of color. Model BB showed the results of the bivariate relationship between total LOS and re-incarceration. As noted, the males of color who remain longer in DYS were more likely to be re-incarcerated than those who stay shorter periods of time. Model CC showed those predictors that were correlated with longer stays and only risk was significant. When LOS was added to the model (Model DD), LOS remained significant and positively correlated with re-incarceration suggesting that, even when controlling for risk and other key variables, males of color who stay longer in DYS were more likely to be re-incarcerated upon release.
Table 18: Logistic regression predicting re-incarceration of males of color for a new crime (N = 2467)

<table>
<thead>
<tr>
<th></th>
<th>Model BB$^{17}$</th>
<th></th>
<th>Model CC</th>
<th></th>
<th>Model DD</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Odds Ratio</td>
<td>B</td>
<td>SE</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>Positive drug screen at intake</td>
<td>.181</td>
<td>.149</td>
<td>1.198</td>
<td>.202</td>
<td>.149</td>
<td>1.224</td>
</tr>
<tr>
<td>Special education</td>
<td>.018</td>
<td>.113</td>
<td>1.018</td>
<td>.016</td>
<td>.113</td>
<td>1.016</td>
</tr>
<tr>
<td>Past substance abuse treatment</td>
<td>.120</td>
<td>.087</td>
<td>1.127</td>
<td>.133</td>
<td>.088</td>
<td>1.143</td>
</tr>
<tr>
<td>Fire setting</td>
<td>.034</td>
<td>.119</td>
<td>1.034</td>
<td>.028</td>
<td>.119</td>
<td>1.028</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>-.097</td>
<td>.150</td>
<td>.907</td>
<td>-.110</td>
<td>.151</td>
<td>.895</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>-.202</td>
<td>.148</td>
<td>.817</td>
<td>-.213</td>
<td>.148</td>
<td>.808</td>
</tr>
<tr>
<td>Medical needs</td>
<td>.088</td>
<td>.086</td>
<td>1.092</td>
<td>.101</td>
<td>.086</td>
<td>1.107</td>
</tr>
<tr>
<td>Age Intake</td>
<td>.028</td>
<td>.0385</td>
<td>1.029</td>
<td>.051</td>
<td>.036</td>
<td>1.052</td>
</tr>
<tr>
<td>Risk</td>
<td>.036</td>
<td>.008</td>
<td>1.037***</td>
<td>.034</td>
<td>.008</td>
<td>1.035***</td>
</tr>
<tr>
<td>LOS (Months)</td>
<td>.013</td>
<td>.005</td>
<td>1.013**</td>
<td>.013</td>
<td>.005</td>
<td>1.013**</td>
</tr>
<tr>
<td>Constant</td>
<td>-.134</td>
<td>.071</td>
<td>-1.309</td>
<td>-.1798</td>
<td>.630</td>
<td>-1.798</td>
</tr>
<tr>
<td>Correct</td>
<td>52.9</td>
<td></td>
<td>54.8</td>
<td></td>
<td>55.9</td>
<td></td>
</tr>
<tr>
<td>predictions (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nagelkerke R$^2$</td>
<td>.004</td>
<td></td>
<td></td>
<td>.018</td>
<td></td>
<td>.022</td>
</tr>
<tr>
<td>Model Chi-Square (df)</td>
<td>6.914** (1)</td>
<td></td>
<td>33.792*** (9)</td>
<td></td>
<td>40.903*** (10)</td>
<td></td>
</tr>
<tr>
<td>Block Chi-Square (df)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^{17}$ Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
Table 19 provided the results of the bivariate and logistic regressions for Caucasian males. Model EE provided the results from the bivariate logistic regression analysis between total LOS and re-incarceration for Caucasian males. As noted, LOS was significant and positively related to re-incarceration suggesting that Caucasian males who stay longer were more likely to be re-incarcerated. The results of Model FF suggest that Caucasian males who had a positive drug screen at intake were less likely to be re-incarcerated while higher risk Caucasian males were more likely to be re-incarcerated. Model GG provided the impact of LOS on re-incarceration while controlling for the variables associated with longer stays. As noted, while controlling for these variables, LOS remained significant and positively correlated to re-incarceration suggesting that Caucasian youths who remain longer at DYS were more likely to be re-incarcerated within 3 years of release.
### Table 19: Logistic regression predicting re-incarceration of Caucasian males for a new crime (N = 1724)

<table>
<thead>
<tr>
<th></th>
<th>Model EE(^{18})</th>
<th>Model FF</th>
<th>Model GG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>Positive drug screen at intake</td>
<td>-.396</td>
<td>.183</td>
<td>.673*</td>
</tr>
<tr>
<td>Special education</td>
<td>.131</td>
<td>.154</td>
<td>1.141</td>
</tr>
<tr>
<td>Past substance abuse treatment</td>
<td>.024</td>
<td>.106</td>
<td>1.024</td>
</tr>
<tr>
<td>Fire setting</td>
<td>.113</td>
<td>.124</td>
<td>1.119</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>.021</td>
<td>.127</td>
<td>1.021</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>.074</td>
<td>.138</td>
<td>1.077</td>
</tr>
<tr>
<td>Medical needs</td>
<td>.037</td>
<td>.108</td>
<td>1.038</td>
</tr>
<tr>
<td>Age Intake</td>
<td>.059</td>
<td>.044</td>
<td>1.061</td>
</tr>
<tr>
<td>Risk</td>
<td>.042</td>
<td>.010</td>
<td>1.043***</td>
</tr>
<tr>
<td>LOS (Months)</td>
<td>.028</td>
<td>.007</td>
<td>1.029***</td>
</tr>
<tr>
<td>Constant</td>
<td>-.945</td>
<td>.089</td>
<td>-2.618</td>
</tr>
<tr>
<td>Correct predictions (%)</td>
<td>65.2</td>
<td>65.4</td>
<td>65.4</td>
</tr>
<tr>
<td>Nagelkerke R(^2)</td>
<td>.014</td>
<td></td>
<td>.024</td>
</tr>
<tr>
<td>Model Chi-Square (df)</td>
<td>17.923***</td>
<td>30.307***</td>
<td>44.049***</td>
</tr>
<tr>
<td>(df)</td>
<td>(1)</td>
<td>(9)</td>
<td>(10)</td>
</tr>
<tr>
<td>Block Chi-Square (df)</td>
<td></td>
<td></td>
<td>13.742***</td>
</tr>
<tr>
<td>(df)</td>
<td></td>
<td></td>
<td>(1)</td>
</tr>
</tbody>
</table>

\(^{18}\) Examined standardized residuals for outliers and found no significant impact on the findings so all cases were included in the analysis.
Interaction Effects of Race, Age, and Risk

Table 20 has four unique models examining the impact of race and age on re-incarceration rates controlling for potential confounding variables. The first model, younger males of color, provided the effects of total LOS on males of color who are 15 years or younger at intake. As noted, while controlling for potential confounding variables, LOS for younger males of color remained significant and positively correlated suggesting that young males of color who stay longer were more likely to be re-incarcerated upon release. As for younger Caucasian males and older Caucasian males, the same was true—staying longer resulted in higher likelihood of being re-incarcerated for a new crime. The only model in which total LOS was not predictive of higher rates of re-incarceration was for older males of color. This suggested that males of color who were 16 years of age or older at intake who stayed longer at DYS were no more likely to be re-incarcerated than those that stayed shorter periods of time.
Table 20: Logistic regression predicting re-incarceration for the interaction effects between age and race for males

<table>
<thead>
<tr>
<th></th>
<th>Younger Males of Color (N = 691)</th>
<th>Younger Caucasian Males (N = 409)</th>
<th>Older Males of Color (N = 1776)</th>
<th>Older Caucasian Males (N = 1315)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Odds Ratio</td>
<td>B</td>
</tr>
<tr>
<td>Positive drug screen at intake</td>
<td>.310</td>
<td>.304</td>
<td>1.364</td>
<td>.429</td>
</tr>
<tr>
<td>Special education</td>
<td>.061</td>
<td>.181</td>
<td>1.063</td>
<td>.194</td>
</tr>
<tr>
<td>Past substance abuse treatment</td>
<td>.236</td>
<td>.173</td>
<td>1.267</td>
<td>.258</td>
</tr>
<tr>
<td>Fire setting</td>
<td>-.163</td>
<td>.217</td>
<td>.850</td>
<td>.166</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>.026</td>
<td>.255</td>
<td>1.027</td>
<td>-.117</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>.131</td>
<td>.278</td>
<td>1.140</td>
<td>-.166</td>
</tr>
<tr>
<td>Medical needs</td>
<td>.529</td>
<td>.170</td>
<td>1.697**</td>
<td>.188</td>
</tr>
<tr>
<td>Risk</td>
<td>-.008</td>
<td>.015</td>
<td>.992</td>
<td>.008</td>
</tr>
<tr>
<td>LOS (Months)</td>
<td>.043</td>
<td>.009</td>
<td>1.044***</td>
<td>.030</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.002</td>
<td>.369</td>
<td>-1.471</td>
<td>.530</td>
</tr>
<tr>
<td>Correct predictions (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nagelkerke R²</td>
<td>.075</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Chi-Square (df)</td>
<td>39.748</td>
<td>(9) ***</td>
<td>11.482</td>
<td>(9) *</td>
</tr>
<tr>
<td>Block Chi-Square (df)</td>
<td>27.612</td>
<td>(1) ***</td>
<td>5.930</td>
<td>(1)</td>
</tr>
</tbody>
</table>
It is noted that in both models examining younger males LOS remained significant. Table 21 explored that relationship in greater detail by examining the interaction effects between race and risk for younger offenders. As noted, LOS for younger, lower risk, males of color were no longer significant in predicting re-incarceration, while LOS for younger, lower risk, Caucasian males remained significant and positively correlated with re-incarceration. As for higher risk youths, younger males of color who stay longer were slightly more likely to be re-incarcerated while higher risk, Caucasian males were significantly more likely to be re-incarcerated the longer they stay at DYS.
### Table 21: Logistic regression predicting re-incarceration for a new crime

<table>
<thead>
<tr>
<th></th>
<th>Younger, Lower Risk, Males of Color (N = 164)</th>
<th>Younger, Lower Risk, Caucasian Males (N = 338)</th>
<th>Younger, Higher Risk, Males of Color (N = 245)</th>
<th>Younger, Higher Risk Caucasian Males (N = 353)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Odds Ratio</td>
<td>B</td>
</tr>
<tr>
<td>Positive drug screen at intake</td>
<td>-.790</td>
<td>.699</td>
<td>.454</td>
<td>.585</td>
</tr>
<tr>
<td>Special education</td>
<td>-.029</td>
<td>.454</td>
<td>.971</td>
<td>.429</td>
</tr>
<tr>
<td>Past substance abuse treatment</td>
<td>.166</td>
<td>.388</td>
<td>1.181</td>
<td>.386</td>
</tr>
<tr>
<td>Fire setting</td>
<td>.377</td>
<td>.406</td>
<td>1.458</td>
<td>-.346</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>-.231</td>
<td>.444</td>
<td>.794</td>
<td>.430</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>.136</td>
<td>.562</td>
<td>1.146</td>
<td>.666</td>
</tr>
<tr>
<td>Medical needs</td>
<td>.453</td>
<td>.388</td>
<td>1.573</td>
<td>.276</td>
</tr>
<tr>
<td>LOS (Months)</td>
<td>.016</td>
<td>.017</td>
<td>1.016</td>
<td>.044</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.331</td>
<td>.419</td>
<td>-1.134</td>
<td>-.282</td>
</tr>
<tr>
<td>Correct predictions (%)</td>
<td>68.3</td>
<td>61.2</td>
<td>68.2</td>
<td>60.3</td>
</tr>
<tr>
<td>Nagelkerke $R^2$</td>
<td>.045</td>
<td></td>
<td></td>
<td>.103</td>
</tr>
<tr>
<td>Model Chi-Square (df)</td>
<td>5.290</td>
<td>(8)</td>
<td></td>
<td>27.270</td>
</tr>
<tr>
<td>Block Chi-Square (df)</td>
<td>.783</td>
<td>(1)</td>
<td></td>
<td>12.065</td>
</tr>
</tbody>
</table>
Table 22 provided the results for the multivariate logistic regression models for older males defined as 16 years or older. For older males of color, LOS was positively correlated with re-incarceration for both lower risk and higher risk youths. For Caucasian males, it appears that LOS was no longer a significant predictor regardless of the youths’ level of risk. This suggested that for an older Caucasian male, a longer LOS has no impact on re-incarceration.
### Table 22: Logistic regression predicting re-incarceration for a new crime

<table>
<thead>
<tr>
<th></th>
<th>Older, Lower Risk, Males of Color (N = 605)</th>
<th>Older, Lower Risk, Caucasian Males (N = 927)</th>
<th>Older, Higher Risk, Males of Color (N = 710)</th>
<th>Older, Higher Risk, Caucasian Males (N = 849)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Odds Ratio</td>
<td>B</td>
</tr>
<tr>
<td>Positive drug screen at intake</td>
<td>-.657</td>
<td>.327</td>
<td>.518*</td>
<td>.228</td>
</tr>
<tr>
<td>Special education</td>
<td>-.297</td>
<td>.316</td>
<td>.743</td>
<td>.148</td>
</tr>
<tr>
<td>Fire setting</td>
<td>-.105</td>
<td>.242</td>
<td>.900</td>
<td>.047</td>
</tr>
<tr>
<td>Self-injurious behavior</td>
<td>.084</td>
<td>.233</td>
<td>1.087</td>
<td>-.204</td>
</tr>
<tr>
<td>Past suicide attempt</td>
<td>.291</td>
<td>.251</td>
<td>1.338</td>
<td>-.096</td>
</tr>
<tr>
<td>Medical needs</td>
<td>.238</td>
<td>.193</td>
<td>1.269</td>
<td>.038</td>
</tr>
<tr>
<td>LOS (Months)</td>
<td>.028</td>
<td>.013</td>
<td>1.028*</td>
<td>-.004</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.251</td>
<td>.228</td>
<td>-1.99</td>
<td>54.5</td>
</tr>
<tr>
<td>Correct predictions (%)</td>
<td>.998</td>
<td>.06</td>
<td>.019</td>
<td>.019</td>
</tr>
<tr>
<td>Nagelkerke R²</td>
<td>.033</td>
<td>.006</td>
<td>.019</td>
<td>.019</td>
</tr>
<tr>
<td>Model Chi-Square (df)</td>
<td>14.192</td>
<td>(8)</td>
<td>10.247</td>
<td>7.520</td>
</tr>
<tr>
<td>Block Chi-Square (df)</td>
<td>4.662</td>
<td>(1)</td>
<td>4.562</td>
<td>(1)</td>
</tr>
</tbody>
</table>
Predicted Probabilities of Re-Incarceration

While the previous tables provided the results of the logistic regression equations, Figures 2 through 8 provided the predicted probabilities associated for the total sample and each of the subgroups examined. As noted in the methods section, the predicted probabilities allowed for an easier interpretation of the results, especially for those equations that examined the interaction effects between race, gender, risk, and age controlling for those variables identified as being correlated to length of stay or recidivism. Figure 2 provided the predicted probabilities of re-incarceration for all youths by the number of months incarcerated controlling for age, race, gender, risk, mental health, fire setting, substance abuse issues, special education status, and medical issues. As noted, youths who stayed one month or less had a 34 percent predicted probability of being re-incarcerated compared to those who stay 60 months who had a 61 percent chance of being re-incarcerated.
Figure 3 provided the predicted probabilities of being re-incarcerated based on the youths’ gender and race. As noted, all youths of color had the highest probability of being re-incarcerated at 1 month, followed by males. All Caucasians had approximately a 25 percent chance of being re-incarcerated if released during the first month, while females had the lowest probability of being re-incarcerated if release during their first month. As the number of months increase, length of stay has the greatest impact on Caucasians increasing from 25 percent chance of being re-incarcerated to 61 percent if they remained in the facility for 60 months, resulting in a 144 percent increase in the likelihood of being re-incarcerated. While Caucasians experienced the greatest increase in re-incarceration rates, males, females, and youths of color all experienced significant increases in the probability of being re-incarcerated for every month they stayed in the facility.
Figure 3: Probability of being re-incarcerated for a new crime by gender and race

Similar to the previous figure, Figure 4 provided the predicted probabilities based on the youths age and risk level. In examining the impact of age, youths 15 years old or younger who were remained in DYS for 60 months were 200 percent more likely to be re-incarcerated than those youths who were released within the first month. Interestingly, those youths who were brought in at age 16 or older experienced a slight but not significant increase in the likelihood of being re-incarcerated. For each month a lower risk youth stays longer in DYS, he or she increased the risk of being re-incarcerated by .40 percentage points resulting in a 63.9 percent increase over the course of 60 months. As for higher risk youths, a similar pattern existed. For those higher risk youths released within a month of being incarcerated, they had a 33 percent chance of being re-incarcerated compared to a 67 percent chance if they stayed 60 months. In other words, for each month a higher risk stayed at DYS, she or he increased the likelihood of reoffending by a little over one-half a percentage point.
Given the results of the previous figures, there was evidence that an interaction effect between males and race existed. Figure 5 showed the predicted probabilities of males of color and Caucasian males. As noted, Caucasian males started with a significantly lower probability of reoffending at intake, but as they stayed longer in the facility the gap between them and youths of color close resulting in almost exactly the same probability of re-incarceration at 60 months. As for males of color, while the probability of being re-incarcerated for a new crime was just above 48 percent if released within the first month, a male of color who stayed 60 months had a 66 percent chance of being re-incarcerated within 3 years of release, resulting in a 37.5 percent increase in the likelihood of being re-incarcerated.
Figure 5: Probability of being re-incarcerated for a new crime by race

Figure 6 presented the predicted probability of the interaction effects between race, age, and gender. As noted, longer stays for older males of color had minimal impact on the likelihood of re-incarceration with almost the exact same probability of re-incarceration at month 1 as month 60. Comparatively, younger males of color experienced the highest increase of the four groups with nearly a 1 percent point increase in the likelihood of being re-incarcerated for each month they stay in DYS. As for Caucasian males, younger and older Caucasian males experienced a higher probability of being re-incarcerated the longer they stay in DYS.
Figures 7 and 8 examined the interaction effects of age, race, gender and risk. Figure 7 provided the predicted probabilities for males who are 15 or younger by race and risk. As noted, younger, lower risk, males of color had a non-significant increase in the probability of being re-incarcerated the longer they stay. While length of stay was not significant for younger, lower risk, males of color, length of stay was significant for each of the other three subgroups. For younger, lower risk Caucasian longer exposure to DYS had the greatest effect, culminating in a 158 percent increase in the likelihood of being re-incarcerated for youths that stay 60 months compared to those released in month 1. Similarly, both younger, higher risk males of color and Caucasians experienced significant increases in the probability of being re-incarcerated the longer they stay in DYS.
Figure 7: Probability of being re-incarcerated for a new crime by age, race, gender, and risk

Finally, Figure 8 demonstrated that the probabilities of re-incarceration were different specifically for older youths of color. For older Caucasian males, no matter the risk level, longer stays in DYS were not associated with a significant difference in re-incarceration rates. This suggested that LOS for older Caucasian males had limited impact on future criminality. As for the older males of color, both lower risk and higher risk males had an increased probability of being re-incarcerated the longer they stay, culminating in an increase of 159 percent and 116 percent respectively for youths who stay 60 months compared to those who are released during the first month.
Summary

The results presented in this chapter provided data to examine the relationship between length of stay and future re-incarceration. The first set of logistic regression models examined the impact of longer stays on all youths controlling for potential confounding variables. The results suggest that for all youths, longer stays in DYS are positively correlated with future re-incarceration. In fact, for each month a youth remained longer in DYS the probability of being re-incarcerated increases by .7 percentage points. The second set of analyses examined the differential effects that race, gender, risk, and age might have on the impact that longer stays have on re-incarceration. Individual logistic regression models were conducted on each factor, controlling for the others, to determine the impact that LOS had on each subgroup (e.g., males, females). Overall, the results suggest that additional time at DYS results in higher recidivism rates for each of the four groups.
Given the significant findings for the previous models, the next step was to examine the interaction effects between race, age, and risk for male offenders. While a few of the combinations resulted in non-significant findings, a majority of the models found that longer stays in DYS resulted in higher re-incarceration rates. The final set of analyses converted the odds ratio to predicted probabilities for easier interpretation and cross-comparison. The final chapter of this dissertation will summarize the findings from Chapter 4 in the context of the research hypothesis. Further discussion will be provided for the use of incarceration for youths, the implications for policy, the limitations of this study, and steps for future research.
CHAPTER 5: DISCUSSION

Introduction

Over the past half century the juvenile justice system has seen significant shifts in its purpose. Originally designed to separate delinquent youths from adult offenders, the juvenile justice system quickly transitioned to a system focused on rehabilitating, or often the case, habilitating youthful offenders. To maximize the efforts of the court to rehabilitate the youths in its care, a parens patriae approach was adopted—exchanging the rights an adult offender is afforded for the flexibility to do what is in the best interest of the youths. While the juvenile court was designed on good intentions, the parens patriae doctrine is predicated on the assumption that the juvenile justice system maintains the philosophy of rehabilitation and ultimately knows what is the most effective means for rehabilitation.

As history has shown, neither of these assumptions has consistently been met. Culminating with Martinson (1974), the faith in programs to reduce delinquency was at a low point. Simultaneously, there was a push to expand the goals of the juvenile justice system to include community safety, retribution, and restorative justice. With a mix of goals and waning support for programming, out-of-home placements increased significantly. In fact, the number of youth placed in long-term custody between 1991 and 2000 doubled (Office of Juvenile Justice and Delinquency Prevention, 2008). Not only did the number of youths during this time period increase, there was a push for youthful delinquents to spend more time in these placements. These approaches led to the introduction of mandatory minimums and expanded gun and gang specification laws (Fagan, 2008). While more youths were being placed in out-of-home custody for longer periods of time, the juvenile justice system still lacked an understanding of how these changes impacted future delinquency. There was an assumption that longer stays resulted in
more rehabilitation, safer communities, just desserts, and/or a restored victim. This dissertation sought to fill the void in the extant research by answering the question what impact do longer stays in custodial settings have on future criminal behavior.

To test this hypothesis, data were collected on youths who were housed in the Ohio Department of Youth Services between 2003 and 2006. To be included in the final sample, youths must have been in a DYS facility between 2003 and 2006, been released by 2008, and not identified by DYS as needing sex offender treatment. The final sample of 4,653 youths was used to determine the impact of longer stays on future criminal behavior. To test the hypothesis, a series of bivariate and multivariate logistic analyses were conducted controlling for potential confounding explanations. Ultimately, the results of the multivariate logistic regression models were converted to predicted probabilities in order to compare and contrast the impact of longer stays on future criminal behavior for all youths combined and then each subgroup of youths. This chapter will discuss the findings in the context of the hypothesis, address the limitations of the study, explore implications of policy decisions, and provide an outline for future research.

**Findings**

The purpose of this dissertation was to determine the impact that longer stays had on future criminal behavior. Ultimately, the four schools of thought: 1) prisons decrease crime, 2) prisons increase crime, 3) prisons have no effect on crime, and 4) the effects of prison vary depending on the individual characteristics of those incarcerated formed the basis for the hypothesis tested in this dissertation. Given the analyses in Chapter 4, several conclusions can be drawn. First, longer stays were associated with higher rates of re-incarceration for the general population. While length of stay only accounted for a small portion of the explained variation, the impact of length of stay was significant and positively correlated with re-incarceration. In
fact, those youths who remained in DYS for five years were 79.4 percent more likely to be re-incarcerated than those youths who were released in the first month, while controlling for individual level characteristics of the youths. Although this dissertation did not directly test the greater school of thought that prisons increase crime, nor did it test the theories associated with this school of thought, it was able to examine one aspect of it—do longer sentences result in more crime. The results of this dissertation lend support for the school of thought that prisons (longer stays) do increase crime.

Second, the impact of length of stay on re-incarceration was found to be conditioned by race, gender, risk, and age. This dissertation found that there were iatrogenic effects for longer stays for males, females, Caucasians, youths of color, younger and older delinquents, as well as lower and higher risk youths. It was not until the interaction effects between gender, race, and age were explored that longer stays in custody resulted in any other effect than increased criminal behavior. Specifically, younger, lower risk males of color and older Caucasian males were the only two subgroups that did not experience significant increases in the likelihood of being re-incarcerated with longer stays.

For younger, lower risk males of color, the findings can be attributed to a small sample size. As for the older Caucasian males, there could be several explanations for why longer stays did not have an iatrogenic effect. First, it is important to note that for those older Caucasian males who stayed one month, the probability of being re-incarcerated was significantly higher than the entire sample and each of the subgroups at the same time point. The higher starting re-incarceration may explain why longer stays had no impact. It appears that for

19 A power analysis conducted using PASS 11.0 suggested that a sample size of 251 youth would be needed to be able to adequately determine the impact that length of stay had on re-incarceration for younger, males of color (Hsieh, F., Block, D. & Larson, M. (1988).
older Caucasian males, being exposed to custody for any period of time was detrimental and resulted in higher re-incarceration rates regardless of the length of stay. Of course, it is not possible to determine if the higher re-incarceration rates were due to being placed in custody, or if these youths just have higher recidivism rates (since this dissertation did not have a no custody comparison group); but it is clear that the rates of re-incarceration were significantly higher at month one in comparison to the rest of the sample.

Age-graded social bonds theory provides one explanation for why older Caucasian males have higher re-incarceration rates. This theory would predict that when natural pro-social connections are disrupted due to incarceration, youths are more likely to engage in future delinquency. Furthermore, youths who stay longer periods of time are less likely to recover from these bonds being disrupted. It may be that older Caucasian males are more susceptible to negative effects if these bonds are severed, and that the harm is done at initial placement into custody with longer stays not affecting the bonds any further. In contrast, for older youths of color these bonds may be more resistant to separation, and only when more time has elapsed is the full effect felt. This could explain why length of stay had no impact on future recidivism for older Caucasian males but their initial recidivism rates were significantly higher.

In addition to age-graded social bonds, labeling theory can provide a potential explanation for the differential impact of length of stay for older males. Labeling theory would predict that youths exposed to longer stays experience greater barriers to returning to the community due to the youths being identified as dangerous and risky. This adopted community view will reinforce how the youths see him or herself and will ultimately lead to higher rates of future criminal behavior. For older Caucasian males, it may be that just being placed in custody
is stigmatizing and that longer stays have little impact; whereas, for males of color the exposure to prison does not have the same impact, but longer stays do have a negative effect.

While this study did not directly test any one theory of incarceration, it did provide a unique opportunity to test the broader schools of thought regarding the impact of length of stay on future criminality. Based on these results, there was no evidence that longer stays actually reduce future criminality under any circumstances; leading to a rejection of the school of thought that prison, under the context of longer stays, can suppress future criminal behavior. As for the school of thought that prisons have no effect, the results suggest that there are a few subpopulations in which longer stays have no effect, but the effects of longer stays on the overall population do not support this school of thought either. In fact, the results of this study strongly support the school of thought that longer stays in prison increase crime and that longer stays have a negative effect on almost all youths, but that effect can be exacerbated by individual characteristics.

**Implications for Future Policies**

While this dissertation examined just one aspect of youths being placed in custody, it is important to acknowledge the potential implications for future policies that deal with extended stays, mandatory minimums, and denial of release. First, policies need to be clear on their underlying purpose. If the primary goal of the juvenile justice system is to rehabilitate youths, any policies that extend a youths’ stay should be examined closely. Given the findings in this dissertation, policies that would include mandatory minimums, gang and gun specifications, and extended stays for non-criminal behavior should be examined specifically to determine if it is in the best interest of the youths. If the primary goal of a policy is to protect the community, further studies would need to examine whether longer stays in DYS result in decreased severity
of future crime and/or the number of offenses committed, as the results here suggest that holding youths, under any condition, at best fails to decrease criminality. While this study did not look at the type of recidivism, there is an assumption that the criminal behavior was serious enough to warrant re-incarceration, suggesting that the harm to the community for accelerating youths’ criminal behavior must be taken into account.

Second, the differential effects of length of stay need to be explored in greater depth. The findings from Winokur et al. (2008) suggest that if youths can be grouped by risk, they may at least be able to minimize the effects of prison while still protecting the community. While this dissertation does not provide insight into how an agency might mitigate the effects of length of stay, it was clear that holding youths longer in secure settings did not result in improved outcome for any subpopulation.

Third, in combination with previous studies by Loughran et al. (2005), Winner et al. (2007), and Winokur et al. (2008), it appears that deterrence based interventions do not result in lower recidivism rates. While there are a few studies that have shown slight decreases in criminal behavior with more serious sanctions, overwhelmingly, tougher penalties, be it the use of detention, intensive supervision, expanded use of bind over, or in the case of this dissertation, longer stays in custody, result in, at minimum, no effect and at worst, increased criminal behavior.

Fourth, this study was the first to examine the implications of longer stays on subgroups of youths. While there are limitations to the findings, the use of tougher sanctions, including longer stays, for all subgroups should be explored before policies are implemented. If any results of this dissertation should be highlighted for policy implications, it is that extending length of stay is generally detrimental for all youths, yet the differential effects for younger
youths and youths of color are significantly greater than for older youths. Given this, any policy decisions that look to extend youths’ stay in custody should take into account that the implications may not be equally distributed across all youths.

Fifth, unlike previous research that found an ideal length of custody (or tipping point) for return in recidivism, this dissertation did not find an ideal sentence length that produced better effects. In fact, all but 2 analyses suggest that for each additional month in custody, youths’ likelihood of being re-incarcerated increases significantly.

**Implications for the Theories of Incarceration**

In addition to informing policy, this dissertation has shed some light on the theories of incarceration, specifically those associated with longer stays in custody. First, it is clear from the data that there was no support for specific deterrence. In fact, in the overall sample, as well as all 22 subgroups, there was not a single finding that supported the assertions that future crime would be deterred by longer sentences. Second, there was minimal support for Zamble and Porporino’s (1990) claim that prisons were a deep freeze and that youths placed in custody remain unchanged through the experience. For the overall sample, longer stays resulted in higher re-incarceration rates. Only for a few subgroups did longer stays result in no change. Third, there was strong support, at least for the vast number of subgroups that longer stays resulted in more crime.

What was not possible in this dissertation was the ability to tease out which of the theories predicting that longer stays result in more crime best explain the results. In review, there were four unique theories that explained why youths might experience increased re-incarceration rates the longer they remained in custody. Social learning theory suggests that youths who are exposed to longer stays will also be exposed to a higher concentration of criminal attitudes, reinforcement for criminal behavior, and exposure to a greater number of higher risk
Youths. Labeling theory states that youths exposed to longer custodial stays will be stigmatized upon their return to the community and will begin to adopt personal views that support criminal lifestyles. Age-graded social bonds predict that youths who experience longer custodial stays will experience greater disruption in pro-social bonds, which will lead to significant increases in the likelihood of being re-incarcerated. Finally, general strain theory suggests that longer stays result in greater strain (stress), and those youths who are held longer experience greater stress than those who remain incarcerated for shorter periods of time.

One subgroup that should be explored in greater detail is younger offenders. Younger offenders who stayed longer were more likely to be re-incarcerated than older youths. To best unpack these findings, several of the theories discussed in Chapter 2 will be reviewed. Age-graded social bonds would offer that younger offenders are removed from their family at an earlier age which disrupts family bonds, relationships with teachers are disrupted as youths are placed out of their community, and lifelong friendships are abandoned the longer the youths remain in custody. Labeling theory could also explain the impact that longer stays have on younger offenders. Labeling theorists would predict that youths placed in custody at a younger age and held for longer periods of time would fully adopt beliefs that they cannot escape their destiny and that they are likely to be a long-term criminal. In addition, youths who entered DYS at an earlier age and stay longer are often identified as a serious offender, resulting in blocked opportunities to prosocial lifestyles. Social learning theory could also explain why youths who enter DYS at younger ages and stay longer do worse. While most teenagers are learning to separate from family and explore new friendships, adolescents housed at DYS are having different experiences. It may be that younger offenders are more susceptible to antisocial definitions or differential reinforcement from peers as their value systems are less established.
Finally, general strain theory could also explain the differential effects of length of stay on younger offenders. Younger offenders are more likely to have fewer coping skills and less ability to regulate emotions. This lack of skills could lead to higher levels of frustration, especially in the face of remaining in custody for longer periods of time. As the youths’ path to release is blocked, they become more frustrated, resulting in even more antisocial behavior.

Based on the results of this dissertation, it is recommended that future studies attempt to isolate the effects of each of the theories associated with prisons increasing crime, to determine if there is one theory that can explain the effects or if it is more likely explained through an integration of several theories.

**Limitations**

While this study found strong support for the school of thought that longer stays increase crime, it is not without limitations. First, this dissertation could only examine the effects of length of stay, and was not able to examine the effects of no prison versus prison. Second, this dissertation was not able to take into account any positive or negative events that affected the youths while in the facility, including any treatment the youths received, any incidents of victimization, contact with family members, or any other change in behavior that may have affected the youths as they progressed through DYS. In addition, this dissertation did not examine the impact of post-release programming. While all youths receive some length of post-release supervision (other than those that age out at 21 years of age), the length of parole was not controlled for in this study, nor was any aftercare programming, which may be quite different from one region to another. Similarly, this dissertation was not able to control for the culture of each facility, which might also impact why youths that stayed longer were re-incarcerated at higher rates. As is typical with studies in corrections, female offenders were underrepresented
which prohibited them from being included in some of the analyses. The study was also limited to Ohio facilities, which impacts the generalizability of the findings.

Even with these limitations, this dissertation provides the field with a clearer understanding of the effects of two decades of get tough policies and the impacts that longer stays have on the youths in custody. In addition, this dissertation provides clarification into the theories of incarceration as applied to juvenile delinquents and assists in understanding policies that are designed to reduce future criminality.

Future Research

While this dissertation advanced the current knowledge and overcame several previous limitations regarding the effects of length of stay on future criminal behavior, there is still much to understand. First, this dissertation focused specifically on a large state system. As identified in Winokur (2008), creating smaller, homogeneous facilities may counterbalance the negative effects of longer stays. Therefore, future research should focus on comparing the effects of length of stay on future recidivism for a continuum of residential options ranging from smaller, community based facilities to large, state-operated facilities. Second, given the results of this dissertation, the effects of longer stays on recidivism for younger adolescents should be explored in greater detail.

Third, it is important to unpack the “black box” of juvenile corrections and explore if treatment programming, educational services, or connection to community supports can offset the impact of longer stays. For example, do housing similar risk youths, at minimum, mitigate the negative effects of length of stay or does providing quality treatment, as Lipsey (1995) suggests, counterbalance the detrimental effects of longer stays? Fourth, future research should examine whether quality aftercare mitigates the effects of longer stays. Fifth, while this
dissertation was able to explore the impact of length of stay on future recidivism for female offenders, the sample was not large enough to explore the interaction effects. It would be beneficial to continue to collect data on females to examine the differential effects for age, race, and risk. Sixth, this dissertation did not include youths committed on a sex offense; given sex offenders tend to have lengthier periods of confinement, future research should conduct similar analyses for this specialized population. Ultimately, this dissertation is a first step in understanding how length of stay can impact future recidivism. It provides the basis to expand future research to further explore the effects of longer stays in custodial settings.
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